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## ORIGINAL ARTICLES.

### THE BEHAVIOR OF THE COSTAL ARCH IN DISEASES OF THE ABDOMINAL ORGANS AND ITS IMPORTANCE AS A DIAGNOSTIC SYMPTOM.

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THE costal arch, composed of the consecutive portions of the seventh, eighth, ninth, and tenth costal cartilages, extends from the lower extremity of the sternum in front obliquely downward, outward, and backward, parallel to the surface of the body to the apex of the tenth rib behind. It serves as a connecting link between the corresponding ribs and the sternum, thus completing the wall of the lower part of the thoracic cavity. The space intervening between the individual cartilages are composed of the same structures as in an intercostal space, namely, of muscles and of fascial layers attached above and below to the borders of the respective cartilages. To their surfaces, as well as to their connecting ribs, are attached in addition the diaphragm, and, in general, the upper portions of all the muscles of the abdominal wall.

Although, in a strict anatomical sense, the lower border of this arch forms in front and laterally the corresponding most dependent portion of the thoracic cavity (which, posteriorly, descends still further to the level of the twelfth rib), it nevertheless practically forms as well a segment of the upper anterior portion of the abdominal wall, corresponding to that portion of the cavity in which very considerable portions of the liver, spleen, and kidneys, and a moderate segment of the stomach are situated; in fact, the lateral portions of the liver and spleen are in places separated from the costal arch only by a very thin partition of diaphragm, pleural cavity, and lung. The extension upward in this way of the abdominal cavity above the lower level of the costal arch is readily accounted for by the well-marked concavity of the domeshaped diaphragm.

Participating, therefore, in the formation of the walls of both the thoracic and abdominal cavities, and serving as well for the attachment and support of the abdominal muscles, it is not at all surprising that the costal arch should be materially affected by pathological conditions of contiguous organs.

In the normal state, the costal arch participates in the respiratory movements of the chest and abdomen, being slightly elevated during inspiration, and lowered during expiration. This excursion can be prevented during quiet respiration by the gentle pressure of the examiner's

hand; in fact, in any part of the respiratory cycle, with the patient in the recumbent position and breathing quietly, the costal arch can, in all its different segments, be forcibly pressed into the abdominal cavity a variable distance, according to the degree of its inherent elasticity. Thus, its sternal extremity—composed entirely of cartilage and supple, as well, in virtue of its intercartilaginous joints, can be depressed a greater distance than its posterior segment, which is more rigid because of the firm ribs with which the cartilages articulate. Again, the arc of excursion gradually diminishes as the patient grows older, due to calciferous degeneration and the resulting solidification of the costal cartilages and the not infrequent obliteration of their joints. In the healthy adult, the completion of ossification in the contiguous ribs account for the fact that the movement of the costal arch is not as extensive as it is in children, although it is very much more extensive than in elderly people.

This normal excursion of movement of the costal arch is frequently disturbed, and this is true not only of its active respiratory movement, but more especially of that passive movement toward the abdominal cavity which it may be made to describe through the pressure of the examiner's finger. Interference with its active respiratory movement is elicited by inspection and is manifested chiefly in asymmetry of expiration, the less extensive expiratory recoil of the affected side being checked in a purely mechanical way, before it has been fully completed, by the presence of underlying neoplastic or inflammatory matter. In these cases the pathological condition must be painless, or, at all events, the pain, if present, must not be intensified by respiration for in painful conditions the resulting involuntary inhibition of respiratory movement affects both arches alike, irrespective of the side in which the inflammatory focus is situated, and no criterion of comparison exists. Hence asymmetry of the elastic recoil of the costal arch is to be observed chiefly in contiguous neoplasms and cysts, and in inflammatory conditions only after the subsidence of the acute and subacute stages and their associated pain and tenderness has taken place. Under these circumstances, accumulation of pus, as in "cold" abscess, may interfere with the recoil of the overlying arch.

Any change in the passive movement of the arch can be detected naturally only by palpation, and in eliciting this symptom, not only should the nature or character of its resistance to the surgeon's finger be determined, but one should observe as well whether the resistance is participated in equally by the entire arch or is most marked in one of its segments. In both normal

and pathological conditions the degree of what may be called the "costal resistance" can be roughly estimated by the distance which the costal arch may be made to traverse through the moderate pressure of the examiner's fingers. The examination should always be conducted with the patient in the dorsal position, and the abdominal muscles should be relaxed as far as possible by flexion of the thighs and by directing the patient to breathe quietly, with the mouth slightly open. The degree of costal resistance is then best ascertained by placing the extremities of the second, third, and fourth fingers of either hand, respectively, on corresponding segments of the costal arches. Quick but gentle pressure is then made simultaneously, during expiration, in a direction toward the vertebral column, and any difference in the degree of mobility of either arch carefully noted. Proceeding downward and backward from the sternum to the tenth rib along the lower border of the costal arch, successive segments are then compared with each other and the presence of costal resistance in any segment readily determined. In case of bilateral costal resistance, symmetrically developed, pressure exerted simultaneously on the costal arches would decrease the distance between to a very much less extent than in normal.

By a similar procedure, the relative resistance of the different segments of one arch may be ascertained, and by unusual deviation from the normal condition detected without comparing the affected segment with the corresponding segment of the opposite side. In this connection, however, the greater normal elasticity of the sternal extremity must not be forgotten, and the desirability of supplementing the examination by a comparison of the abnormal with the normal side cannot be too greatly emphasized.

Under normal conditions, either costal arch may be depressed in this manner a very appreciable distance, and it may roughly be stated that in children, especially near the sternal extremity, this distance is somewhat greater than an inch; in adults, and as the vertebral extremity is approached, between one-half and three-quarters of an inch, while in old people, the distance decreases considerably less than one-half an inch. On the other hand, in pathological conditions, both the character and degree of costal resistance vary very widely. Thus the resistance is of a hard, unyielding nature in the presence of underlying neoplasms, the sensation here imparted not differing materially from the sensation imparted by the palpation of a similar immovable growth on the exterior of the body; in a general way, it may be described as "board-like" in quality, and is not in any sense of the word elastic. In the presence of an acute or subacute inflammatory process, however, the costal resistance is very highly elastic, and the excursion of its movement very considerably limited. In the early stages of such a condition, before the formation of exudate, the increased resistance presented is due to more

or less complete immobilization of the costal arch through the reflex contraction of its attached muscles. Subsequent exudation of serum or pus still further increases the pre-existing costal rigidity, and diminution is observed only after subsidence of the acute stage has taken place.

It is very important to emphasize, that asymmetry of costal resistance may be detected when there is no marked difference in the respiratory movement of the costal arches. Thus, as has previously been mentioned, in all acute inflammatory conditions of adjacent organs, the involuntary inhibition of the respiratory movement of the costal arch affects both sides alike. The difference in the costal resistance in a case of this character is, however, easily appreciated, and only in those instances (which must be very rare), in which the pathological process is symmetrically developed in the upper half of the abdominal cavity could any difficulty in eliciting this symptom be encountered.

Increase in costal resistance may or may not be associated with tenderness or pressure. Resistance due to the presence of neoplasm may usually be detected without pain or discomfort to the patient. On the other hand, pressure on the affected segment of the costal arch in adjacent inflammatory conditions almost invariably elicits tenderness if the process be acute, and occasionally in chronic cases as well.

The behavior of the costal arch in the presence of painful inflammatory conditions in the lower half of the abdominal cavity sometimes deviates from the normal. In these cases, respiration is involuntarily largely thoracic, and the abdominal muscles are held motionless in order that there may be the least possible displacement of the inflamed organ. This accordingly results in a symmetrical decrease of the costal respiratory movement, and, on palpation, a corresponding symmetrical increase of the costal resistance may be observed, although it is usually not well pronounced. Notwithstanding, however, that inflammatory processes in the lower half of the abdominal cavity are not generally associated, in their early stages, with any appreciable change in the degree of costal resistance, subsequent extension upward, should it occur in any instance, will result in the gradual development of this resistance as soon as the inflammatory process approaches a costal arch. In these cases the manifestation of this symptom serves a most useful purpose, not only as an indication for immediate operative interference, but also as a guide to that part of the abdominal cavity in which the inflammatory process is most rapidly extending, and to which the surgeon's efforts should be energetically directed.

*Case I.*—P. J. H.; male, aged thirty-three years; admitted to the Presbyterian Hospital March 27, 1902. Patient denies venereal trouble. Has always indulged moderately in alcoholics. Fourteen years ago suffered from an attack of acute intermittent fever. During the past six



years, patient has had occasional attacks of indigestion. On January 27 last, patient developed for the first time an attack of severe, cramp-like pain, located in the right hypochondrium, lasting between eight and nine hours, and associated with chilly sensations with subsequent fever. The subsidence of the pain was followed by jaundice, the stools became clay-colored, and the patient was in bed for four days, during which time there was tenderness and swelling over the region of the gall-bladder. The jaundice and clay-colored stools persisted for from between two and three weeks, and then disappeared, the patient feeling perfectly well and able to resume work. On February 24 there was a similar attack, the acute, cramp-like pain lasting for seventeen hours, and again on March 25, when the pain persisted for twenty-four hours.

*Examination on Admission.*—There is tenderness over the right hypochondriac region and a small mass can be felt, movable with respiration, having the configuration of the gall-bladder. There is considerable rigidity of the upper portion of the right costal arch and of the upper part of the rectus directly beneath it. There is slight icterus, with moderate pulse and temperature elevation. At the end of several days, the local symptoms of inflammation together with the icterus, had subsided, and both pulse and temperature had returned to normal.

*Operation.* (Gas and Ether).—Vertical incision along the outer border of right rectus about four inches in length, and deepened to and through the peritoneum. The gall-bladder was embedded in a mass of omentum, the upper border of the transverse colon being adherent to the anterior border of the liver. After separation of the adhesions, the gall-bladder was exposed and was found to be slightly increased in size with a very much thickened wall. The neck of the bladder and the cystic duct were then enucleated from the bed of adhesions in which they were contained, and through their wall numerous calculi could be felt. The gall-bladder was so firmly adherent to the under surface of the liver that its separation could not be accomplished without risk of hemorrhage. It was therefore opened, some forty calculi of varying size removed from its interior, and after the excision of its mucous membrane, it was sutured to the parietal peritoneum, as in a typical cholecystotomy. Drainage.

*Postoperative.*—There was moderate temperature and pain. After a week or ten days the bile found its way down the common duct, and the clay-colored stools disappeared. On May 22, the date of discharge, a small superficial sinus persisted, which subsequently closed.

*Subsequent History.*—Patient continued well for about fourteen months. At the end of that time, some soreness and redness developed in the cicatrix, and on examination a small elastic mass could be palpated. Under an anesthetic the swelling was incised and a small abscess evacuated. Through the abscess cavity the fin-

ger could be inserted into the gall-bladder, the walls of which presented a smooth, velvety surface. Only at its fundus, where it emerged into the abscess cavity, was there any evidence of cicatricial tissue. The abscess cavity was drained and quickly closed by granulation without the establishment of a biliary fistula. Since that time (six months ago) there has been no further trouble.

*Case II.*—R. M., female, aged forty-four years; admitted to the Presbyterian Hospital December 22, 1902. With the exception of occasional attacks of subacute rheumatism, patient has always been well until the development of the present trouble. Last July, after a hard day's work, patient was seized with a severe pain, extending from the pit of the stomach up to the right breast, lasting about one and a half hours and followed by fever and perspiration. During the following night and the next day there were several attacks of slight hematemesis. There was also a slight tinge of jaundice, lasting only for several days. Five weeks ago the second attack occurred, similar in its general features to the first, but more severe. Ever since then, these attacks have been repeated on alternate days, without hematemesis, and three weeks ago pain in the right shoulder-blade developed. During this time patient has been unable to attend to her household duties.

*Examination on Admission.*—There is tenderness on pressure over the region of the gall-bladder, with moderate rigidity of the corresponding portion of the costal arch and of the upper portion of the rectus muscle. No mass can be felt. There is moderate jaundice. Temperature, 100° F.; pulse, 100; both becoming normal on the day after admission. On the third day after admission, temperature rose suddenly to 105° F., the pulse to 100. On the fourth day, the temperature was normal in the morning, but rose to 104° F. in the afternoon. On the fifth day, the temperature rose to 103° F. and then gradually fell, becoming normal at the end of the week. During this time, there was moderate leucocytosis, but repeated examinations of the blood failed to detect the presence of any variety of plasmodium. The local symptoms of tenderness and rigidity had persisted practically unchanged.

*Operation January 9* (Gas and Ether).—Vertical incision along the outer border of the right rectus. On opening the peritoneal cavity, the duodenum was found adherent to the under surface of the liver in what corresponded to the fissure of the gall-bladder. The gall-bladder itself was shriveled up to a small mass of connective tissue containing calculous material. It was separated from the tissue in which it was embedded and removed after ligation of the cystic duct. Closure of the abdominal wound in layers after the insertion of a small cigarette drain to the stump of the divided duct.

*Postoperative.*—Nausea and vomiting per-

sisted for several days, during which time the pulse varied from 120 to 136 and the temperature between 100° and 102° F. At the end of the third day the bowels moved to catharsis, and a biliary fistula became established. Subsequent convalescence, interrupted only by an accumulation of discharge in the wound, three weeks after the operation. Patient has been perfectly well during the past year.

*Case III.*—C. H. W., female, aged forty-four years; admitted to the Presbyterian Hospital February 8, 1903. Family and personal history negative. Patient has had three attacks of biliary colic, one three years ago, one two years ago, and the last ten days ago. These have all been characterized by dull abdominal pain, most intense in the lower right quadrant, radiating to the epigastrium and up the back, lasting from four to six hours and necessitating the patient's going to bed. There has been occasional vomiting during the attacks and considerable constipation. There has never been any jaundice. Three days ago, the fourth and most severe attack developed, the character and the location of the pain being the same as in the previous attacks.

*Examination on Admission.*—There is rigidity of the upper portion of the right costal arch and of the adjacent rectus muscle. A smooth, elastic mass of oval shape may be felt occupying the region of the gall-bladder, extending down from the lower border of the liver to a point one inch below the umbilicus. It is tense and elastic, and by bimanual examination fluctuation may be detected. It is dull on percussion. The patient was treated by local applications of ice and kept in bed. At the end of ten days the pain had disappeared, the mass had greatly diminished in size, reaching inferiorly to a point two inches above the level of the umbilicus. Some costal rigidity still persisted. During this interval the temperature reached a point no higher than 100° F. and the pulse at no time exceeded 90.

*Operation, February 20, (Gas and Ether).*—Vertical incision along the outer border of the right rectus. On opening the peritoneum, the omentum was found adherent to the gall-bladder, which was greatly thickened, somewhat distended, and contained a considerable amount of thick fluid, detritus, and hardened concretions. After the separation of the omentum, and the examination of the cystic and common ducts, which were found to contain no calculi, the gall-bladder was opened and a cholecystotomy performed, the mucous membrane having been removed with scissors and forceps. A probe could be passed through the gall-bladder into the duodenum. The convalescence was uninterrupted, the resulting biliary fistula closing in about six weeks. There has been no recurrence.

*Case IV.*—M. W., female, aged forty-two years; admitted to the Presbyterian Hospital April 6, 1903. Family and personal history negative. Fourteen years ago patient was seized with abdominal pain, cramp-like in character, located

in the epigastric region on either side of the median line, but more severe on the left side, lasting for several days. Since that time these attacks, preceded by a chill and frequently accompanied by nausea and vomiting, have recurred at intervals of every month or two until the last six months, when the attacks have occurred as frequently as every week or ten days. Each attack lasts generally about one or two hours, occasionally for as long a time as two days. Seven years ago, during an attack, jaundice developed and has recurred frequently during the past six months. The attacks have also been characterized by pain in the back.

*Examination on Admission.*—There is tenderness in the region of the gall-bladder, but no mass can be felt. There is rigidity of the corresponding portion of the costal arch and of the adjacent rectus muscle. On the day of admission, the temperature rose to 106° F., preceded by a chill, the pulse to 120. On the following day both the pulse and temperature were normal.

*Operation (Gas and Ether).*—Vertical incision along the outer border of the right rectus. On opening the abdominal cavity, the gall-bladder was completely buried in a mass of adhesions of omentum and duodenum. These were readily separated, however, and the bladder was dissected from the under surface of the liver to a point corresponding to the junction of the cystic and hepatic ducts without any considerable hemorrhage. The common duct was found to be free, a probe being passed down into the duodenum. The pancreas was thickened, and the foramen of Winslow was obliterated. The cystic duct was ligated with chromic gut and the abdominal wound closed after a cigarette drain had been inserted down to the stump of the divided duct.

*Postoperative.*—The patient suffered but little pain. After the end of a week the drain was removed. At no time was there leakage of bile. At no time was either the pulse or temperature above 100. Examination of the gall-bladder showed its wall to be very much thickened and its cavity to contain several hundred calculi about the size of dice. Its wall was considerably inflamed. Patient has enjoyed excellent health since the operation.

*Case V.*—M. C., female, aged sixty-six years; admitted to the hospital March 16, 1902. Two years ago patient suffered from colicky pain in the region of the gall-bladder, radiating to the opposite side and regularly followed by chills, fever, constipation, and jaundice. These attacks recurred at intervals of four months, and recently as frequently as two or three times a week. The duration of the attack has varied between one and two days. Patient has lost twenty pounds in weight and has become very weak.

*Examination on Admission.*—Patient is moderately jaundiced. On palpation, there is increased costal rigidity in the region of the gall-bladder and of the adjacent rectus muscle. By bimanual examination the smooth oval outline of



the gall-bladder may be felt projecting a distance of two inches below the lower level of the liver. It moves with respiration. Examination of the urine shows it to be of a specific gravity of 10.20, to contain a small amount of albumin and hyaline casts. The patient's discomfort was so great and the progressive loss of flesh and strength so marked, that she desired to take the risk of an operation notwithstanding the unfavorable condition of the urine.

*Operation (Gas and Ether).—*The gall-bladder was exposed through a vertical incision along the outer border of the right rectus, and was found to be moderately distended and free from adhesions. Owing to her general condition, a cholecystectomy was considered ill-advised, and therefore after noting the absence of any calculi in either the cystic or common ducts, the gall-bladder was incised, its contents evacuated, and a cholecystotomy performed. The gall-bladder contained a considerable amount of thick mucus and several friable calculi of large size.

*Postoperative.*—The patient did nicely for forty-eight hours, the pulse remaining under 100, and without special rise in the temperature. At the end of that time the urine decreased rapidly in quantity, the albumin and casts increased, and the symptoms of uremia became established, the patient dying one week after the operation. Unfortunately no autopsy could be obtained. There was no symptom of peritonitis.

*Case VI.*—L. J., aged twenty-five years; admitted to the Presbyterian Hospital November 10. Patient was always well until about two years ago. At that time, and again six months later, patient suffered from two attacks of catarrhal appendicitis, of which the latter was the more severe. Shortly after the subsidence of the last-mentioned attack, the appendix was removed, the wound healing by primary union. The patient continued to enjoy excellent health until one year ago, when, without warning, a severe colicky paroxysmal pain developed in the right hypochondrium radiating from there to the epigastric region and back. Icterus developed, the stools became clay colored, and the patient was confined to bed for three weeks, chiefly on account of the severity of the paroxysmal pain. The attack then subsided and the patient was well until five weeks ago, when the pain recurred. On this occasion it was continuous, and rapidly became so severe as to require hypodermics of large amounts of morphine. This attack has been associated with moderate jaundice. There has been scarcely any rise of temperature at any time during the attack.

*Examination on Admission.*—There is acute tenderness on pressure in the region of the gall-bladder, with rigidity of the upper segment of the rectus. The adjacent portion of the costal arch is very rigid and cannot be depressed any appreciable distance toward the vertebral column. On bimanual examination a small rounded mass about the size of a lemon can be felt projecting

downward below the free border of the liver at a point opposite the junction of the eighth and ninth costal cartilages. For the twenty-four hours preceding operation, the temperature varied between 99° and 100° F.; the pulse remained between 70 and 80. There was 15,000 and 20,000 leucocytosis respectively in two examinations, separated by an interval of twenty-four hours.

*Operation (Gas and Ether).*—A vertical incision along the outer margin of the right rectus to the upper extremity of which was later added a horizontal incision extending inward through the fibers of the rectus. The gall-bladder was completely hidden from sight by the adherent great omentum and colon, but was rather easily enucleated down to the region of the foramen of Winslow. The gall-bladder was of large size, its walls thickened and greatly distended, and its separation from the liver above was accomplished only with considerable difficulty. No calculi could be felt in any part of the common duct, and the organ was removed by the division of the cystic duct between clamps, the divided duct and its accompanying vessels being subsequently ligated with chromic gut. After the insertion of a rubber drain down to the stump, and a cigarette drain to the same place through a counter-opening in the right flank, the abdominal wound was closed. Examination of the gall-bladder showed its wall to be very considerably thickened, especially in the vicinity of the junction of its neck and the cystic duct, where almost complete obliteration has resulted from the previous productive inflammation. Its cavity contained a considerable quantity of thick turbid fluid containing a small quantity of bile only. There were two large feceted calculi of the size of acorns and of a peculiar nutmeg appearance.

*Postoperative.*—During the first twenty-four hours there was a gradual increase in the pulse and temperature from 88 and 101° F. to 128 and 104° F. respectively in the afternoon. There was considerable pain and some nausea and vomiting. There was a free discharge of bile from the upper wound on the second day, and forty-eight hours after the operation the pulse had diminished to 94 and the temperature had receded to 103° F. On the third day the bowels moved to catharsis, the stools being clay-colored. From this time there was a gradual subsidence in the temperature, and the pulse varied between 72 and 80. Some distressing hiccough, however, continued until the beginning of the second week. At about the end of the second week the biliary discharge decreased and the stools began to lose their clay color. At the end of the third week the amount of biliary discharge was very slight. At no time was there any discharge of bile through the counter-opening in the flank, which promptly closed after the removal of the drain. Five weeks after the operation, patient returned to work with a very small biliary fistula.

*Case VII.*—*Acute Cholecystitis without Calculi.*

*lus.*—F. K., male, aged thirty-seven years; admitted to the Presbyterian Hospital January 31, 1902. Patient, a painter by occupation, admits a moderate beer-habit, until ten years ago, since which date he has drunk but very little.

For the past fourteen years, at some time during the summer, patient has had an attack of diarrhea with slight jaundice, lasting for two or three days. The last attack, one year ago, was more severe than any of the others. The present attack began one week ago, with a chill, followed by a rise of temperature to 105° F. There was vomiting and pain over the vicinity of the gall-bladder. The bowels were constipated and lighter color than normal. The urine was high-colored.

*Examination on Admission.*—The whole abdomen was slightly retracted. There is pain and tenderness over the gall-bladder, but no enlargement can be detected. There is rigidity of the corresponding part of the costal arch and of the adjacent rectus. There is also moderate rigidity of the lower right quadrant and of the entire left half of the abdominal wall. Temperature was 103° F., the pulse 100 (at no time higher), both rapidly decreasing and reaching normal within several days, with simultaneous subsidence of the local symptoms.

*Operation One Week after Admission* (Gas and Ether).—A vertical incision over the outer upper border of the right rectus deepened into the peritoneal cavity. The gall-bladder was distended, its wall was thickened, and it contained turbid bile. Its lining membrane was congested. There were no calculi. A probe could not be passed into the duodenum. The operation was completed by suturing the gall-bladder to the parietal peritoneum and inserting a drain of gauze into its cavity.

*Postoperative.*—The convalescence was uneventful, the biliary fistula closing within two months. December 1, 1902. Patient has enjoyed excellent health since the operation.

*Case VIII.—Cholelithiasis in the Quiescent Stage.*—N. P., aged thirty-one years; admitted to the Presbyterian Hospital May 31, 1902. Patient was always well until five weeks ago, when, without known cause, she was seized with an attack of vomiting and of general abdominal pain, becoming localized within twenty-four hours over the region of the gall-bladder. Subsequently the pain extended to the right scapular region. There was slight jaundice and fever. The stools were of a greenish color and constipated. The pain was so severe as to require chloroform inhalations. In forty-eight hours the attack had subsided. One week later, a similar attack occurred, lasting for thirty-six hours, and followed by pain in the right scapular region for days afterward.

*Examination on Admission.*—There is pain and tenderness over the region of the gall-bladder, the pain being also elicited by indirect pressure through the overlying eighth costal carti-

lage. There is rigidity of the corresponding portion of the costal arch, but none of the adjacent rectus muscle. In other respects abdominal examination is negative.

*Operation* (Gas and Ether).—A vertical incision was made along the outer border of the right rectus. On opening the peritoneum, the gall-bladder presented, free from adhesions, of small size, firmly fixed to the under surface of the liver, and through its walls several calculi could be felt. The foramen of Winslow was obliterated, but no calculus could be felt in either the cystic or common duct. The gall-bladder was cautiously opened and six calculi, each faceted and about the size of an acorn, were removed. The mucous membrane was excised, and the bladder stitched to the parietal peritoneum. No probe could be passed into the duodenum.

*Postoperative.*—Patient had several attacks of sharp abdominal pain, resembling biliary colic, during the first six hours after the operation. These attacks ceased with the generous discharge of yellow-colored bile through the fistula, and the further convalescence was undisturbed and uneventful, the biliary fistula closing completely within six weeks. December 15, 1903. Patient has enjoyed excellent health since the operation.

(To be Continued.)

## THE PULSE AS A GUIDE TO THE LIFE INSURANCE EXAMINER.\*

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LIFE insurance companies justly attach great importance to the records of the pulse, especially as regards its rate and rhythm, but so far as I am aware most of them do not lay particular stress upon its tension. So many and diverse conditions influence pulse rate and rhythm that, considered by themselves, these characteristics are of minor importance, and therefore in the apparently healthy man they should be considered in connection with the blood pressure. For this reason it is proposed in this paper to discuss all three characteristics of the pulse with relation to their bearing on life insurance examinations.

Since a persistent pulse rate of more than 85 is by most companies considered a barrier to insurance, it will be well to first discuss the value and causes of abnormal frequency of heart-action. In the first place clinical experience teaches that a pulse rate of even 100 may be natural to some individuals, and so great an authority as Gibson has stated that more importance is generally attached to undue acceleration than this feature of the pulse deserves. Persons to whom such unusual pulse frequency is habitual are generally of a neurotic temperament, which probably accounts for their tachycardia, and Gibson cites the instance of an Edinburgh shopkeeper who, in addition to a pulse rate never

\* Read before the Society of Life Insurance Examiners, December 22, 1903.



below 100, manifested pronounced agoraphobia. This fact should therefore be borne in mind when estimating the significance of persistent rapidity of the pulse.

In the great majority of cases tachycardia is not natural to the individual, but depends upon some factor which puts vagus control in abeyance, or counteracts its influence through stimulation of the accelerator nerves of the heart. Among such exciting factors tea, coffee and tobacco, when used to excess, stand forth conspicuously. Tobacco also slows the action of the heart (Gibson), but it has been my observation that it more often accelerates the pulse, even to the extent of occasioning palpitation. Its effect is said to sometimes persist for six months, or even more, after its abandonment. In this country I believe coffee has to be reckoned with more often than tea, and I can recall several instances of tachycardia and palpitation, in which there was a history and admission of immoderate consumption of this beverage. In one healthy young man tachycardia and frequent intermittence were by himself attributed to coffee and cigars. Alcohol is another recognized cause of frequent heart-action which should always be borne in mind. Not only does it accelerate the pulse for the time being, but old toppers often display persistent increase of the pulse rate, and in them, of course, one is naturally suspicious that a chronic myocarditis is at the bottom of the tachycardia.

The caution that should be exercised in attributing serious import to mere frequency of the pulse is exemplified by the instance of a man forty-nine years old, whom I saw recently. He had a pulse rate of 120, yet was without subjective consciousness of the fact. There was nothing to point to heart disease and inquiry elicited the statement that two hours previously he had submitted to an intranasal operation that had necessitated the application of cocaine.

The most frequent, and to my mind the most annoying, cause of tachycardia is the psychological disturbance attending examination of the heart. In some instances the individuals are outwardly composed and assert their indifference to the examination, yet their hearts race away as if possessed. The examiner feels confident of the nervous influence at work and yet he knows that to record a pulse rate of 110, or perhaps 120, will be very apt to invalidate the man's prospect for insurance.

Furthermore, under the influence of excessive frequency of contractions, changes take place in the cardiac findings which become puzzling or are unsatisfactory to record. The apex beat becomes feeble and ill-defined, the first sound at the apex is murmurish, or perchance actually replaced by a faint murmur due perhaps to temporary lack of perfect tightening of the valve-segments by the pull of the papillary muscles. Under such conditions the area of relative dullness may be actually increased transversely, as I have many times observed. What is one to do in these annoying and puzzling cases?

So far as possible the physician must take cognizance of other signs of nervousness, as flushing of the face, coldness of the extremities, slight tremor, etc., and he must resort to devices calculated to divert the patient's attention. Thus it has seemed to me advisable to study the pulse while at the same time plying the person with questions concerning his past history or engaging him in conversation on some topic foreign to the matter in hand. Any practitioner of experience may thus gain a fairly accurate knowledge of the pulse rate, even if he does not actually count the pulse at the time. Later on the record can be made without attracting particular notice, or the count may be compared with one made at the close of the chest examination after some reassuring words have been spoken.

I have sometimes found it useful to stand behind the patient and count the carotid beats while he is engaged in the recital of his anamnesis. It is also a good practice to make those nervous individuals recline at ease on a couch when the excited heart will often quiet down materially. After a time they may be told to jump up suddenly, or to hop on one foot about the room for the purpose of testing the competence of the heart, for it has been my observation that a merely excited heart does not show as marked contrast between the rate of the pulse at rest and during exercise as is the case when the tachycardia is due to cardiac inadequacy.

An important matter in determining the significance to be attached to undue frequency of the pulse is its tension. Only exceptionally is blood pressure materially increased by pronounced tachycardia, such as is apt to attend psychical disturbance, whereas increased frequency of the pulse due to some pathological disorder of myocardium is generally associated with increased pulse tension. The statement is generally made that a slow pulse is also a tense one, or conversely that a tense pulse is also slow, but my experience leads me to agree with Rosenbach in his assertion that increase of tension and acceleration are generally combined. Of course, this statement must not be understood as applying to increased frequency of the pulse due to valvular disease, but to that form of hypertrophy seen in the chronic myocarditis of robust middle-aged men with such capacious chests that accurate determination of deep-seated cardiac dullness is difficult. In such a person, therefore, with a pulse rate of 85 to 90 the physician should carefully study the degree of arterial tension.

There are several other causes of abnormal pulse frequency which should be borne in mind. It may be a symptom of pyrexia, and hence it is wise to take the temperature when accelerated cardiac action is observed. It is also most important to remember that tachycardia is said to be a symptom of heart syphilis, especially if combined with irregularity and not attributable to any other ascertainable cause. One should not forget also that abnormal frequency of heart action may be a symptom of the irritable heart of the young

man, which is overstrained by athletics or is weakened by masturbation or venereal excess. Such cases are by no means uncommon. Finally in all cases minute inquiry should be made concerning some recent illness, such as typhoid fever, diphtheria and influenza, since it is well known that the heart may remain rapid for weeks or even months after convalescence, even without obvious signs of cardiac disease.

In concluding this portion of my paper I think it may be safely stated that a pulse rate of over 85, or even of 100, is not to be regarded as in itself indicating cardiac disease. In persons past middle age it is possibly of more serious import than in the young, but even in the former it is not to be regarded as of pathological significance, if no signs or symptoms of beginning inadequacy can be discovered. If, on the contrary, it is associated with abnormally high and sustained pulse tension in a man of middle age with a corpulent abdomen, tachycardia is to be regarded as an early sign of heart-strain and consequently of weighty import. I would not consider such an individual a good risk.

Lowering of the pulse rate to below 60, which is, I believe, the minimum number of heart beats per minute allowed by insurance companies, requires but brief discussion. It likewise may be normal to the individual, yet, even when not congenital, it is not always to be looked upon as denoting some cardiopathy. Nevertheless, unlike tachycardia, it is not the result of nervous or psychical influence, and hence its cause should be sought out before it is attributed to myocardial degeneration. In fact, we now know that decreased frequency of the pulse is less often indicative of fatty degeneration than was formerly supposed.

Two considerations are worthy of note: (1) Retardation of the pulse due to prolongation of diastole from increased vagus inhibition is very different from apparent bradycardia caused by failure of some, perhaps half, of the heart beats, to send a wave to the radial artery. In the latter condition there are abortive or, as Mackenzie terms them, "the early occurring imperfect systoles" due to defective stimulus or defective response to stimulation. This state of things is therefore serious, and calls for careful comparison on the part of the examiner of the number of cardiac contractions with that of the pulse waves. (2) Bradycardia in a man of middle age is likely to be of far more serious import than in the young, since it may portend cardiac exhaustion. Therefore, when an elderly individual presents slowness of the pulse a careful search should be instituted for signs of arteriosclerosis. If the peripheral vessels show slight thickening or minute points of calcareous deposit and in addition the aortic second sound is unnaturally ringing, there is good reason to suspect chronic myocarditis, whether the heart appears negative or not. Be cautious about recommending such cases, since they are likely to prove disappointing.

As already stated, it is commonly supposed

that increase of vascular tension goes with retardation of the pulse, but Rosenbach asserts the contrary to be the case; namely, increased tension with increased rate, and it has often been my observation that lowness of tension is associated with slowness of rate, and pronounced lowness of blood pressure in a person of middle age in the absence of valvular disease is a sign of cardiac weakness.

The disorders of rate just considered are in themselves sufficiently striking to attract attention at once, but unless very extreme they are not so apt to create alarm as is some disorder of rhythm, particularly intermittence. The rhythm of the pulse may be deranged in any one of three ways. It may be irregular, intermittent, or both irregular and intermittent. Since then so much importance is attached to arrhythmia of the pulse it will be well to discuss these deviations from normal with reference to their causes and relative significance.

By intermittence of the pulse is meant, as everybody knows, a dropping out of a pulse beat at regular or irregular intervals and frequently or infrequently, as the case may be. When it occurs at short intervals it is startling and very likely to create the impression of some serious pathological disorder. Clinical experience, however, teaches that such is by no means the fact in the majority of cases. This conclusion becomes apparent when we consider the mode of its production.

The cardiac muscle fibers possess an inherent or automatic power of contraction, and under the stimulus of healthy blood usually contract with a certain definite rhythm. Nevertheless they are under the control of the pneumogastric nerve, so that if the vagus be stimulated the heart may be made to beat more slowly or even to cease its pulsations altogether. When the heart intermits therefore it is because of inhibitory influence sent down the pneumogastric. Instead of the systoles taking place with accustomed regularity, the diastolic period is now and then prolonged and the expected pulse wave is missed at the wrist.

Such intermissions may occur rhythmically or arrhythmically, yet, in either case they are but the expression of vagus inhibition. This being so, it is plain that intermittence of the pulse does not by any means indicate cardiac disease. Its cause generally, perhaps always, lies in some disturbing factor outside the heart and most often in the gastro-intestinal tract. It may occasionally be due to psychical or nervous disturbance. Some such factor is probably at work when intermittence is observed in young and apparently healthy subjects. When it occurs in the middle-aged it may have the same origin, but it may also be due to the gouty poison, whatever that is. At all events simple intermission of the heart's action is not a sign of cardiac disease in itself. As will be seen later on, however, it has quite another significance when the intermittence is apparent and not actual, that is, is of the pulse and not of the heart.



Irregularity of the pulse is a condition in which the individual pulse waves do not display uniformity in force and volume, but are unequal in size and strength. In this state of things it is found that cardiac contractions are likewise of unequal force. At regular or irregular intervals, as the case may be, feeble or abortive systoles occur which are what Mackenzie termed "early occurring imperfect systoles."

These feeble contractions take place at a shorter period of time than normal after the preceding normal systole and consequently are followed by a corresponding lengthening of the succeeding diastole. The heart does not actually miss beats, but it is irregular in the rhythm of its beats. If now some of these abortive systoles are too feeble to send corresponding waves of blood to the peripheral arteries, then the pulse appears to be, or rather actually is, intermittent as well as irregular in force and volume. This state of things has a very different meaning from mere intermittence. Doubtless irregularity of the heart's action may be due to the fact that the blood is altered in quality or quantity, as in acute infectious fevers without actual cardiac disease, in which case we may conceive of defective or variable stimulation of the cardiac muscle.

But probably these abortive systoles indicate more often some alteration in the muscle fibers themselves, in consequence of which they do not invariably respond with uniform strength and rate to the stimulus applied to them. Therefore it is very common to observe this kind of irregularity of the pulse in mitral disease and in chronic myocarditis when the auricles are degenerated and perhaps distended. It is, therefore, not uncommon in elderly men, with or without other demonstrable evidence of cardiac disease.

These abortive systoles are sometimes the cause of apparent bradycardiac as well as of pulse intermittences, and in any case of abnormal infrequency or of intermittence of the pulse, one should compare the heart beats with the pulse waves by means of auscultation. If they do not agree, be careful how you recommend the person for insurance.

Lastly under this head permit me to call attention to the fact that whenever the pulse grows irregular under exercise it is in all likelihood an indication of myocardial weakness which renders the heart unequal to the strain. Fortunately there are usually in such cases objective signs of cardiac disease which the careful examiner will not fail to detect. It may, however, be of aid in correctly estimating the wisdom of recommending a cardiopath as an underaverage or defective risk.

Finally, let me say a few words concerning the significance and value of pulse tension. The men whom it is most difficult to judge correctly are those of middle age who are well nourished and present the appearance of robust health. They usually have capacious chests and, in some instances, rather too corpulent abdomens. In such cases pay particular attention to the tension

of the pulse, for it is often the earliest and the most valuable sign of a state of things which will some day declare itself as serious inadequacy of heart or kidneys, or of both.

If the pulse is firm and strong, difficult to compress, and with it is found a ringing aortic second tone, they furnish good presumptive evidence of cardiac hypertrophy even though in consequence of the voluminous lungs the area of cardiac dulness appears not increased. Remember that high and sustained blood pressure, together with moderate hypertrophy, is in the absence of positive urine findings early, and often conclusive, evidence of a beginning interstitial nephritis. Abnormal pulse tension in an elderly man who lives well is oftentimes an indication of sclerosis of the mesenteric arteries, a condition which is very apt to lead eventually to arterial changes in the aorta and coronaries, in short to the hypertrophy generally associated with chronic myocarditis. For these reasons it is my opinion that an essential part of the paraphernalia of every insurance examiner should be some one of the devices now established as reliable for the clinical recognition of too high blood pressure. The use of a Gärtner tonometer, for example, would save many a dollar to the insurance companies and spare the examiner much mortification.

#### SOME EXTERNAL DISEASES OF THE EYE DUE TO RHEUMATISM.\*

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THE purpose of this paper is to call attention to those forms of external diseases of the eye which are distinctly rheumatic in their origin, although this has not been ascribed as the causative factor. Neither text-book nor medical journal refers to this influence in producing these affections, and, in our changeable climate they are of sufficiently frequent occurrence to merit consideration. Failure to recognize this fundamental condition is responsible for a continuation of painful, sometimes grave diseases affecting even the integrity of the visual organ itself. Many patients with blear eyes, distorted lids with reddened edges and lost eyelashes, spotted corneæ and lessened sight, the unfortunate victims of long-continued and unsuccessful treatment, would have recovered with uninjured or but slightly damaged eyes had the direct cause of the existing malady been known or even suspected. It is not my intention to claim that all of these bad results might have been prevented; but it can be declared beyond the question of a doubt that the large majority of these patients might have had useful vision restored had critical discrimination in diagnosis been exercised. With an

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acute realization of the position that I take I wish to emphatically state my absolute disbelief in the fantastic theory that rheumatic diseases are due to microorganisms, discovered or undiscovered.

The suboxidation theory with its concomitant results of faulty metabolism and increased dissimilation amply explains, except to those perverted by vast excursions into the limitless realms of fancy, the formation without microbic intervention of a chemical poison from whose toxic influence arises the pathological changes and the protean symptoms of that complex which we recognize as rheumatism.

The diseases that will be considered under the title of external diseases of the eye due to rheumatism are: (1) Marginal blepharitis of the young adult; (2) recurrent hordeoli or styes; (3) recurrent chalazia; (4) circumscribed bulbar conjunctivitis; (5) limited circumscribed bulbar conjunctivitis, and (6) striated keratitis.

*1. Marginal Blepharitis Occurring in Early Adult Life.*—The form of marginal blepharitis with which we are most familiar is that occurring in children up to the age of puberty. This is usually associated with the so-called strumous diathesis, often depending upon some local irritation as its exciting cause. The variety due to rheumatism differs from this in that it occurs in early adult life, from about the eighteenth to the twenty-fifth year, and sometimes continues up to the thirty-fifth year. Like other diseases arising from systemic causes, it is always bilateral from the beginning and unlike this affection in the young there is no involvement of adjacent structures, the inflammation being restricted to the borders of the lids and never encroaching upon the skin or conjunctiva. It likewise differs in the fact that although there may be some photophobia present, and dust and cold wind may cause an annoying and discomforting irritation, sight is rarely interfered with to any extent. The edges of the lids are red, swollen and everted, and there is an increase in the sebaceous secretion which gathers at the roots of the eyelashes and with exfoliated epithelial cells forms scales and crusts beneath which superficial and deep excoriations exist, the healing of which often produces extreme distortion of the lids. Errors of refraction and muscular imbalance, either or both are competent to set up conditions identical with those just described; but examination of sight readily discloses the defects, and properly fitted glasses will overcome these troubles and likewise accomplish much good by serving as a protection against cold winds and dust.

Rheumatic marginal blepharitis is precisely that condition, the determining cause not having been recognized, which authors declare "*to be more or less constant, without known cause and with little possibility of a cure.*" Against this etiological agnosticism, and therapeutic nihilism. I must enter a firm protest, for, if optical error when present be corrected, muscular insufficiency overcome and a thorough antirheumatic treatment, medicinal and dietetic, be enforced, rare

indeed will be the case that does not respond to treatment and terminate in recovery. Especial stress is laid upon the necessity for an early diagnosis as to the cause of this trouble because of the serious outcome of the unchecked inflammatory process. Neglect to promptly discover rheumatism as the cause will bring about swollen and permanently thickened and everted lids producing ectropium. Or later cicatricial contraction may invert the lids with resultant entropion with misplaced eyelashes curled inward which start up corneal irritation, inflammation, ulceration and more or less dense opacity, giving rise to interference with, or even abolition of sight. Contraction of the lid tissues not infrequently displaces or even obliterates the punctum lachrymale, and constant lacrimation supervenes to the lasting discomfort and annoyance of the sufferer.

Accompanying inflammation of the borders of the lids is a similar condition of the hair follicles, which we call styes. These may occur independently of the lid trouble and are extremely painful, the redness and swelling being very considerable and entirely disproportioned to the extent and gravity of the disease. Styes are not only multiple but often recurrent, and when this happens they are due to the rheumatic poison. Given a recrudescence of styes, some of them abortive—the so-called "blind" styes—and any optical anomaly present having been antagonized by properly adjusted glasses, local irritation from dust, exposure to heat or cold having been eliminated, the cause is rheumatism.

From hordeolum to chalazion is but a step, as the first named is an acute inflammation of the hair follicle and its surrounding tissues, the other a chronic inflammation of a meibomian gland rarely accompanied by pain. Chalazia have heretofore been considered to be retention cysts, the first stage of which was a plugging up of the gland duct and retention primarily of the normal, and then of a changed secretion.

Recent investigations have demonstrated that a true inflammatory process followed or was coincident with the sealing of the gland orifice. As soon as discussion began respecting the etiology of chalazion the wary bacteriologists hunted through their stock of unassigned microorganisms and handed out the *Bacillus xerosis* as the direct infecting agent. This microbe normally exists in the conjunctival sac and until an explanation is offered to account for the change from feeble to stronger pathogenic properties, oculists will be loth to accept this *ipse dixit* as conclusive evidence.

When chalazion becomes recurrent it is distinctly rheumatic in type. This opinion is founded upon clinical experience, which the history of the following case exemplifies:

The patient had submitted nine times to operation for the removal of chalazia and seemed still far from being relieved from further trouble, for three small elevations on his lids were slowly but regularly increasing. He was looking cheerlessly forward to future operations when he was



suddenly seized with rheumatic fever, his initial attack, which confined him to bed for days and to the house for weeks. Treatment was at once employed and on his recovery from the rheumatic attack he found that the lid tumors had entirely disappeared.

A few months later a small chalazion appeared on the lid, antirheumatic treatment was at once instituted and local massage with white precipitate ointment was regularly applied. Complete absorption of the enlargement supervened. The local treatment cannot be held responsible for the cure, because it was employed on every tumor previous to operation and in not one of them did it produce the slightest amelioration. This case is not an isolated one, as equally good results have been obtained so many times that when chalazion takes on the *recurrent* form I insist that antirheumatic medication and regimen be adopted. In the vast majority of cases a cure follows.

Do not infer from what has been said that I hold the rheumatic poison to be the sole exciting cause of chalazion, for such is not my opinion. Mechanical or inflammatory occlusion of the gland duct, cold, dust, burns, chronic blepharitis and optical defects may one or all be named as active participants or predisposing factors in producing this unsightly but innocuous condition. The influences just enumerated having been removed, controlled or eliminated and recurrence persisting, rheumatism is at the bottom of the trouble, and its treatment will eventuate in recovery; but this applies to small and recent growths where there is retention of secretion only, and possibly but slight epithelial hyperplasia. When, however, the tumor is materially enlarged, and is more or less firmly attached to the cartilage, proliferation of connective tissue has been added to altered epithelium and the gelatinous secretion has become purulent or mucopurulent, so that medicinal and dietetic treatment are unavailing, an operation is the only recourse.

There is a form of conjunctivitis rheumatic in its origin, which I call circumscribed bulbar conjunctivitis, the distinctive feature of which is that it is localized to the conjunctiva of the eyeball and never encroaches upon the membrane of the lid. It effects but one-half of the eyeballs and by preference the nasal sides. Since beginning this paper I have seen a case in which the temporal halves almost to the median line were involved. As in other forms of conjunctivitis the blood vessels were enlarged, tortuous, easily emptied on pressure and freely mobile. This type varies from other forms in that the discharge is watery, a mild, not profuse lachrimation, and is never mucopurulent nor purulent. This inflammation comes on without any prodrome, usually during the night, seems to follow exposure to a sudden lowering of the external temperature and must be considered as an occupation disease seeming to attack only those employed out of doors. Engineers engaged in constructing bridges, rail-

ways, subways, or electrical enterprises; architects supervising the erection of buildings; pilots and the ubiquitous book agent, seem to be the susceptible ones. My first case happened in the person of an engineer on the electric subway. I saw him three days after the trouble began. The general appearance, pain and inflammation were so acute and intense that a tentative diagnosis of episcleritis was made and treatment at once inaugurated, a strict antirheumatic course being adopted. Within three days the improvement was so conspicuous that only one opinion was tenable, namely, that the conjunctiva alone was affected. A few months later a second attack was experienced. General treatment was instituted within twenty-four hours from the inception of the trouble, no local treatment was employed and in about one week the cure was complete. About six months later his third attack came on, and before his physician reached him he was seized with an attack of acute articular rheumatism involving both knee-joints. There was considerable swelling and the suffering was intense. Before a single dose of medicine had been taken the conjunctival congestion localized to the nasal side of both eyeballs, spontaneously disappeared, and did not return during the course of the disease. It is to be borne in mind that this was his initial attack of rheumatism, for, excepting the two attacks of conjunctivitis, he had been free from any symptoms of rheumatism, never having suffered from even the muscular pains that are so generally experienced.

He has had two attacks of rheumatism since recovering from his first one, but in neither of these latter has there been any conjunctival implication. The appearances in this disease strongly resemble those observed in scleritis, but, being an innocuous ailment, it has none of the sinister portent that accompanies scleritis. Discriminating diagnosis can easily be made, provided the following points be observed:

#### CONJUNCTIVITIS.

A feeling as if a foreign body were between the lids and the eyeball.

No special tenderness of the eyeball.

Neither elevation nor discoloration of the sclera.

Enlarged tortuous vessels, freely movable over the sclera and easily emptied on pressure.

#### SCLERITIS.

A feeling of fullness in both lids and eyeball, usually beginning in the eyeball.

Considerable degree of ciliary tenderness.

Sclera elevated, the patch reddish in color going over to purplish in the centre.

Straight vessels like fine red threads in the elevated patch, not movable and but slightly changed in color on pressure. A few large tortuous vessels may be superimposed over the finer ones: this is not constant, but when they are present, the scleral vessels are conspicuous by contrast.

## CONJUNCTIVITIS.

Discharge watery.  
Photophobia slight, if present.  
Pain, smarting in character.

## SCLERITIS.

Rarely any discharge.  
More or less photophobia.  
Dull or aching pain, not neuralgic.

There is a variety of this disease restricted to the conjunctiva directly over the insertion of one of the recti muscles, which simulates scleritis so closely that mistakes in diagnosis are common, but if the points in differentiation just quoted be carefully observed accurate diagnosis presents no difficulty. This is the limited circumscribed bulbar conjunctivitis.

Finally, we come to striated keratitis, a rare disease, but of which I have seen several cases. In its appearance, to the unaided eye, it strongly resembles the striped keratitis that semi-occasionally follows cataract extraction, especially after tardy and difficult removal of the lens. In such cases the appearances are due either to a folding of decemets membrane or of the deeper layers of the flap. In striated keratitis of rheumatic origin the cornea assumes a grayish tint and very shortly thereafter grayish parallel lines appear, bisected at almost right angles by similar lines, producing a checkerboard appearance that is absolutely distinctive. Deep infiltration of the cornea follows, subsequent to which occurs the circumcorneal injection so suggestive of keratitis. At this stage the disease is easily mistaken for parenchymatous keratitis, but treatment applicable to this latter condition is without the slightest response, while a long continued antirheumatic course consisting of salicylates, iodides, baths, massage, etc., will bring about complete restoration.

This brings to a conclusion all that I have to say on the subject of external diseases of the eye due to rheumatism. From this paper has been omitted mention of chronic conjunctivitis of the rheumatic and gouty, corneal ulcers of middle and advanced life, scleritis and the other ocular diseases due to rheumatism, because they are fully described in text-books, whereas those that have been brought to your notice in this paper are conspicuous by their absence, no allusion whatever being made to them. Because of this omission I have brought this subject before you, as I wished to enter an earnest plea for the early recognition and diagnosis of this causative factor, in order that it should receive immediate treatment to prevent damage and in some cases disaster to sight.

36 West Forty-seventh Street.

**Glycogen in Leucocytes.**—All former theories relative to the presence of glycogen in leucocytes have taken it for granted that the cells of the circulating blood are entirely free from this carbohydrate. A. WOLFF (Zeitsch. f. klin. Med., Vol. 51, Nos. 5 and 6) shows, however, that if the vapors of iodine are allowed to act upon a still moist specimen of blood, every normal leucocyte will be found to contain glycogen. This glycogen is extremely soluble, and hence cannot be detected by the usual methods; as soon as the leucocytes leave the vessels it can be demonstrated.

## RUPTURE OF THE SPLEEN: REPORT OF TWO CASES.\*

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RUPTURE of the spleen, especially spontaneous rupture, is of such rare occurrence that I have thought that the two following cases occurring at the U. S. A. General Hospital, Presidio, San Francisco, Cal., might be of general interest and should be recorded. As showing how rare spontaneous rupture of the spleen is, especially in this country, Osler<sup>1</sup> states that no case of spontaneous rupture of this organ has been recorded here. The condition is said to be much more frequent in the Tropics, but it is to be noticed that writers upon tropical diseases, such as Manson<sup>2</sup> and Scheube,<sup>3</sup> in their classical works devoted to that subject do not mention this condition. Playfair,<sup>4</sup> however, states that in an experience of two and one-half years in the East Indies he observed 20 cases, but I have been unable to determine whether or no these were spontaneous in character. Strümpell,<sup>5</sup> in his text-book upon medicine, does not consider this subject at all, and Stengel,<sup>6</sup> writing upon the diseases of the spleen, devotes but two pages to this condition. Bovaird<sup>7</sup> cites a case of rupture of this organ in splenomegaly due to a slight fall upon the abdomen.

The condition is said to be most frequent during malarial infections, or in patients suffering from typhoid fever, or relapsing fever, and rare instances have been observed of rupture of the spleen in blood diseases, such as leucemia. I cannot believe that the rupture of this organ is of very common occurrence in malarial infections. The condition has never occurred in thousands of cases of malaria which I have personally observed, and in a study of the estivo-autumnal malarial infections<sup>8</sup> I have mentioned the occurrence of rupture of the spleen, but at the time of writing had never seen or been told of one instance by practitioners in malarial regions. Since then, Assistant Surgeon William P. Banta has informed me of a case under his care in Manila in which rupture of this organ occurred during a malarial infection, probably due to some violent movement of the patient, although this history cannot be clearly proven. That the condition, however, is a rare one, even in malarial infections, I believe there can be no doubt, and this is proven by the experience of lifelong students of malaria, such as Marchiafava and Bignami.<sup>9</sup> The latter authority observed a case in the person of a young man suffering from a relapse of estivo-autumnal malaria, who was suddenly seized with severe pain in the left side accompanied by symptoms of collapse, and ending in death in forty-eight hours. The autopsy showed a slight laceration of the capsule of the spleen, and the peritoneal cavity contained a large amount of blood. The same authorities quote

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two cases observed by Bastianelli, of patients suffering from pernicious malarial infections. In the first case the patient was brought to the hospital moribund, and at autopsy a large amount of blood was found in the peritoneal cavity and a large clot situated above the spleen. The capsule of the spleen was detached by the coagulated blood, but the laceration was small, and the severe hemorrhage was due to the fact that a medium-sized artery was perforated. In the second case, the patient was brought to the hospital in the same condition, and at autopsy the peritoneal cavity was found filled with blood and a laceration of the capsule of the spleen was found about two c.m. long. An examination of the organs and the blood in both these cases showed numerous malarial parasites of the estivo-autumnal variety.

The rupture may be spontaneous or due to mechanical violence but never occurs spontaneously in a healthy subject. Rupture due to mechanical violence, such as a severe fall upon the side or abdomen, may, of course, occur in health. Laceration of the spontaneous variety may occur at any portion of the capsule of the organ and may be single or multiple. The hemorrhage may be violent or very slight, according as the laceration is slight or severe. The laceration often occurs through the site of an infarct. The effused blood may entirely fill the abdominal cavity or may become encapsulated in the vicinity of the spleen or surrounding organs. Litten<sup>10</sup> describes cases in which the spleen being adherent to the stomach or intestines, and the rupture occurring in the adherent portions, the blood was effused into these organs.

The symptoms associated with rupture of the spleen vary in ratio as the laceration is slight or severe. In those cases in which the tear is of large extent the symptoms are those of a severe and rapidly fatal collapse. In other cases where the laceration may be very slight, the hemorrhage is slow and the symptoms of collapse develop very gradually. There is no reason to doubt that in some very slight lacerations recovery may take place, but in the vast majority of cases the condition is invariably fatal unless proper methods of treatment are pursued. In the two cases I shall describe, so far as the history can be obtained, the laceration was spontaneous. One of them occurred in the person of a patient suffering from typhoid fever. The other, and the most interesting, in a case of primary carcinoma of the liver with metastatic involvement of the lungs. For the clinical history in this case I am indebted to Assistant Surgeon Edward P. Rockhill, U. S. Army.

*Case I. Rupture of the Spleen Occurring During Typhoid Fever.*—H. W., twenty-three years old, birthplace, New York. Date of entrance to hospital, September 12, 1902. Previous history, not obtainable. The patient was a soldier returning from the Philippines on the U. S. Army Transport "Meade." His present illness began about eight days before admission, with headache,

backache, and several slight chills. He stated that he had been feeling badly for about two weeks. Patient was diagnosed on the transport as a case of intermittent malarial fever. Upon admission, the symptoms chiefly complained of were headache, severe diarrhea, and tympanitic abdomen. The blood was examined September 12, 1902, and found negative for malaria. On September 15 Widal's reaction was requested and found positive, with a dilution of one in forty, in ten minutes. From this time until October 3 the patient ran a typical course of typhoid fever, and at this date his temperature had reached normal. In the clinical notes of the case on October 3, it is stated that that morning the patient felt cold and sleepy. His temperature became subnormal and there was slight delirium. On October 4, the temperature having remained subnormal, the patient complained of severe pain over the abdomen, especially in the left hypochondrium. This pain increased during October 5 and the patient presented all the symptoms of collapse, but not of very severe character. This condition persisted until October 7, when he became rapidly weaker during the afternoon of that day and complained of very severe pain over the whole abdomen. After six o'clock in the evening he became comatose; the pulse was imperceptible, the skin bedewed with cold perspiration, and death occurred at 11:40 P.M.

*Autopsy.*—Body considerably emaciated; rigor mortis, medium; finger nails congested; slight ante-mortem discoloration over the chest and abdomen; slight post-mortem discoloration over the dependent portions of the body; pupils slightly dilated, the right being the larger; finger nails slightly congested; weight, 110 pounds. *Abdominal cavity.*—Upon opening the abdomen the greater omentum was found adherent to the coils of the intestine by lymph and the small intestine was greatly dilated with gas and covered with purulent exudate. The coils of the intestines were adherent to one another. The abdominal cavity contained a considerable amount of purulent exudate. The appendix lay on the brim of the pelvis and appeared inflamed. The mesenteric glands were greatly enlarged. Upon removing the intestine in the region of the spleen, a large amount of blood was found confined to the region immediately surrounding the spleen, and upon examination of that organ a large laceration through the capsule was discovered at the lower portion, measuring about 3 cm. in length. The injury, however, was not confined entirely to this laceration, as the capsule of the spleen was removed over an area measuring 3 by 6 cm. and there was considerable laceration of the splenic substance. The organ measured 20 by 11 cm., was externally dark reddish-purple in color and the capsule was slightly wrinkled. Upon section, the surface was of a dark mahogany red color, the Malpighian corpuscles being indistinct. The organ was very greatly congested and it was found that the laceration extended for a distance of 1 cm. into the substance of the organ. The

pathological lesions found in the other organs were those common to typhoid fever. The large intestine showed a few old ulcerations, evidently dysenteric in character, which were almost healed. The ileum showed numerous typical typhoid ulcerations, and it was noted that some of these had nearly perforated, extending to the serous coat of the intestine.

This case is interesting in that the rupture was without doubt spontaneous, as the patient was so ill, having suffered a severe and long-continued typhoid infection, that he was confined to his bed and kept very quiet. It is hard to say just when the rupture occurred, although it is probably at the time he first complained of the severe pain in the side. The collection of blood would without doubt have become encapsulated had the patient survived long enough, and as it was, it was localized entirely in the region surrounding the spleen, there being no free blood elsewhere in the abdominal cavity. The question arises as to the etiology of the peritonitis which was present. It may have been, and probably was, due to the effusion of blood into the peritoneum, but it might have been caused by the extension of bacterial infection from the intestine, as several of the ulcers were simply separated from the abdominal cavity by the exceedingly thin serous coat of the intestine. Cultures were made from the spleen and resulted in a pure growth of the typhoid bacillus.

For the clinical history of the second case I am indebted to Dr. T. J. Strong, U. S. Army.

*Case II. Rupture of the Spleen Associated with Primary Carcinoma of the Liver and Metastatic Carcinoma of the Lungs.*—J. C., sixty years old; birthplace, Ireland. Date of entrance into hospital, February 6, 1903. History previous to admission presented nothing of interest beyond the fact that patient had suffered from malarial fever for fifteen years and had used alcoholics for twenty-five years. His present illness he dated from December 2, 1902, and claimed that it resulted from a fall which he received at that time. At any rate, he had been sick since this fall. Upon entrance to the hospital patient was found to be emaciated and complained of severe vomiting and pain in the right side below the ribs. He had almost complete anorexia. Upon examination it was found that he had severe edema of the abdomen, and that the liver reached six or eight inches below the ribs. The examination of the blood was negative, as was also that of the urine. From his alcoholic history and the enlargement of the liver, the case was diagnosed as chronic hypertrophic cirrhosis of the liver. During his stay in the hospital his symptoms were chiefly those already enumerated, i.e., great weakness, anorexia and vomiting. Upon March 5, at 5 A.M., it was noticed that his breathing had become somewhat difficult, and death occurred very suddenly.

*Autopsy.*—Body considerably emaciated; skin of a yellowish color; rigor mortis absent; marked post-mortem discoloration over the dependent

portions of the body. *Thoracic and Abdominal Cavities.*—Upon opening the abdominal cavity, it was found to be filled with blood. The liver reached 11 cm. below the border of the last rib and extended entirely across the abdomen, and was so large that it severely compressed the stomach and the spleen. Upon examination of the latter organ, a laceration of the capsule was found measuring 9 cm. in length. The stomach, pancreas, spleen and intestines were bathed with blood which had escaped from this laceration. Upon removing the organ it was found to measure 15 by 10 cm. The capsule was smooth and the organ a dark purplish-red in color externally. The laceration was situated along the upper border, and upon examination this portion was discovered to be involved in a large red infarct through which the laceration had occurred. A cyst was found closely associated with this infarct, measuring 1 cm. in diameter and filled with blood, thus showing that previous hemorrhage had occurred within the parenchyma of the organ. The consistence of the organ was almost diffuent.

*Liver.*—Considerable difficulty was experienced in removing the liver as it was adherent to the diaphragm, the stomach, and the spleen, and was so large as to almost fill the upper half of the abdomen. Upon examination the capsule was found to be smooth, although there were small nodules discretely scattered over it. Upon section of the organ, four large tumor masses were found which presented the typical appearance of carcinoma, the largest of these masses measuring 15 cm. in diameter. Only a small part of the liver tissue was not involved in the carcinomatous process. *Stomach.*—The stomach showed a very severe chronic gastritis, but there was no indication whatever of malignant disease, although this was looked for very carefully. The small intestine appeared normal save for intense congestion. *Pancreas.*—The pancreas was considerably congested, but otherwise normal. *Left Kidney.*—The left kidney measured 13 by 5½ cm. It was much congested externally. The capsule was smooth, there being no evidence of cystic formation. Upon section, the cut surface was found to be greatly congested. The cortex and pyramids were indistinct and the cortex thinner than normal. The mucous membrane of the pelvis was also much congested, and the consistence of the organ was increased. The capsule was not adherent. The right kidney presented the same appearance as the left. *Heart.*—The heart appeared normal. *Lungs.*—The pleural cavities were free from fluid. The left lung was adherent to the chest wall over its entire surface by old adhesions. The lung was crepitant in places but had a nodular feel. Upon section of the organ, it was found filled with small tumors, the largest not measuring over 1 cm. in diameter, and upon section these little masses presented the typical appearance of metastatic carcinoma. The right lung was adherent to the chest wall over its entire surface by old adhesions. The pleura was greatly thickened, and upon section the entire organ was



found invaded by metastatic growths which were evidently of carcinomatous nature. In both organs the small tumors showed here and there through the pleura.

Upon microscopical examination of sections from the tumors of the liver and lungs they were found to be of typical carcinomatous structure.

This case is of great interest in that it showed two very rare conditions: First, primary carcinoma of the liver; and, secondly, rupture of the spleen. The primary growths of the liver occurred in the form generally described as the massive form of primary carcinoma, and a study of the microscopical sections showed that there had been previously, without any doubt, a severe cirrhosis of the organ. The rupture of the spleen was, I believe, due to the pressure upon it of the greatly enlarged liver. That it was spontaneous—in the sense that it was not due to sudden movement—is, I believe, true, because the patient was so ill that he could hardly move in his bed. The substance of the spleen was very much decreased in consistence, and the fact that there was a large infarct just beneath the laceration, which involved it, would conduce to the occurrence of rupture by pressure, as the capsule over this infarct was much thinner than normal. In my mind, there can be no doubt that the spleen became wedged between the wall of the abdomen and the liver, and that the growth being gradual, the pressure hindered circulation in the upper portion of the organ, thus causing the infarct, and with this pressure continuing, a rupture occurred. I believe this is the only case on record in which rupture of the spleen was produced in this manner. The clinical symptoms in this case varied greatly from the one just previously described in that death was due to the enormous amount of hemorrhage from the large laceration, which took place suddenly, and caused almost instant collapse; whereas in the first case the laceration was of less extent, the hemorrhage more gradual, and the effusion of blood localized, thus prolonging the patient's life.

Microscopical examination of sections of the spleen in both cases did not show anything of interest beyond intense congestion, and in the latter case the ordinary pathological lesions of red infarct.

In closing, I would call attention to the great difficulty of diagnosing this condition. In the first case described the collapse would undoubtedly have been attributed to late perforation in typhoid, while in the latter case the condition was so rapidly fatal that the diagnosis could not have been reached. In cases of malaria, however, in which there is sudden or gradual collapse, a diagnosis could be more easily made, and this condition should always be thought of should such symptoms develop. It is safe to say, however, that very few cases of rupture of the spleen are diagnosed before death.

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#### SOME FEATURES OF RENAL TUBERCULOSIS.

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IN this brief paper I shall outline for our discussion the aspects of diagnosis and treatment of renal tuberculosis and shall aim at presenting the diagnostic features in relatively early cases.

The history alone in the case of any new patient is ordinarily enough to awaken suspicion that we are dealing with the disease under consideration. The answer to our first question, "Of what do you complain?" is usually sufficient to give a clue when the patient replies: "I am annoyed by passing my water so often." Tabulating the anamnesis of this patient in regular order, its review, together with fifteen or twenty others where the same disease has existed, will afford a composite picture of the following sort:

The patient is a male or female, of an age from twenty to thirty-five years. The family history shows that one or the other parent died of consumption. Not unlikely a brother or sister has or has had some of the chronic manifestations of tuberculosis. The personal history tends toward revealing a past story of more or less ill health, although exceptions to this are noticeable. The present complaint dates from and is remembered in association with some prolonged muscular effort where exposure to wet or cold occurred at the same time, more or less of a chilling resulted, followed by some fever, and the first frequency of micturition was then noticed. Many of the cases had, a few months before, met with a fall or some kind of injury involving one or the other lumbar region, and the place has been somewhat sensitive ever since. When the patient was first bothered with frequency, this symptom lasted only a week or ten days, followed by a seemingly normal condition of the bladder. Another attack, some two months later, associated with mild fibrile state, malaise, and loss of appetite, led the attending physician to diagnose malaria and treat the case as such. After improvement in the constitutional symptoms, the pollakiuria this time continued longer than before, and the patient now for the first time paid some attention to the appearance of the urine, as it was caught in a glass vessel; the fluid in the majority of cases had a mild opacity, like milk-tinted water, in a few instances the patient observed, a slight reddish tinge which suggested a possible admixture of blood. There was never any real pain connected with urination, but a moderate intimation of discomfort in the suprapubic region, and the annoyance of having to get up at night for micturition, which was just as compulsory at regular intervals as during the day. A very few of the

patients have at times had such severe pain in the loins and down the side, accompanied by nausea and vomiting, as to make their medical attendant diagnose renal colic of calculus or gravel origin. The degree of pollakiuria in the majority of the patients amounts to emptying the bladder every two hours.

We are now ready to make our own observations in any of the foregoing cases. It is seen that the patient is usually poorly nourished, but even if rotund and well muscled the color is faulty. Temperature is a degree or so above the normal. Bimanual palpation over the loins gives a tenderness on one side or the other, even if the kidney is not palpable. In the female cases we do not attach too much importance to the presence of a palpable and tender kidney on the right side, even after we have established the diagnosis of urinary tuberculosis, for the left organ may be the seat of the disease and yet not palpable nor so tender as is the commonly prolapsed but otherwise healthy right gland.

Instead of being satisfied with the urinary specimen which the patient has perhaps brought, request is made that the bladder be now emptied in two glasses. This gross inspection of the just voided fluid may be of considerable value in supporting our suspicions as to the nature of the case with which we are dealing. At any rate we do not fail to examine microscopically a drop of the sediment in the fluid state. If every field is made up of few or many leucocytes with practically no other ingredient, and particularly if micro-organisms are conspicuously absent, the suspicion of tuberculosis is increased. Several slides of the sediment are now dried and stained for tubercle bacilli. If in the faintly blue field we find an occasional minute granule holding the red fuchsin stain, whatever these spore-like bodies are, they may reasonably serve to encourage the expectation that ere long two or three typically arranged tubercle bacilli will be met. When found we may be pretty sure of the diagnosis, but before risking the announcement to the patient it is well to get another specimen by means of a sterile catheter and thus avoid a possible contamination of the urine by the smegma bacillus which tends, both morphologically and in the staining reaction, to resemble the tubercle bacillus. On again finding the same microorganisms after such exclusion of smegma bacilli we are prepared to tell the patient that it is necessary to determine the source or sources of these consumptive germs, for as yet we are wholly unable to give advice as to future treatment, not knowing whether the bacilli come from a vesical or renal lesion, and if of the latter origin, from which side.

The fact that one kidney is palpable and tender does not justify the conclusion that it is the seat of the disease. To determine this question the catheterizing cystoscope is brought into use. Up to this point we have been depicting the physical signs and symptoms of a renal tuberculosis which started in the cortex or parenchyma of the gland, in other words a tuberculous implantation of

hemotogenous origin, and not the much rarer form of the disease where a tuberculous pyelitis or pyelonephritis, secondary to ureteric extension of a bladder tuberculosis, has occurred. Consequently the conditions to be expected when we now employ the catheterizing cystoscope are those which go with the mildest sort of tuberculous vesical involvement if any. Even here the bladder is at best somewhat hyperesthetic and as generous an anesthetization with cocaine or eucaine as is consistent with safety should be employed.

The limits of this paper will not permit us to consider even a few of the many interesting points connected with the technic of this examination test, nor the various conditions which the bladder may present. It must suffice to allude to that almost pathognomonic appearance of the ureter mouth, which was first graphically described by Willy Meyer as accompanying a renal tuberculosis on the same side. This consists of an odematus pouting or even a prolapse of its mucous membrane with more or less erosive and hyperemic lesion on part of its periphery. But I have had occasion to demonstrate in two cases that the ureter mouth associated with a tuberculous kidney may appear as normal as its fellow. Occasionally a turbidity, due to blood or pus, can be noted in the fluid issuing from the ureter. But of vastly more importance in reaching a positive diagnosis and of gaining an operative prognosis is the evidence to be derived from examination of the separate urines of the two kidneys. And this is secured by the ureter catheters which are now inserted by the same instrument. The eye of each catheter rests at a point about two inches within the mouth of its respective ureter.

We shall be obliged to pass over the varied behavior of the normal and the diseased kidney during the collection of their excretions, remarking only that the fluids seen in these collecting bottles here attached to the cystoscope represent the gross appearances and show the contrast ordinarily met in synchronous ureter catheterization, where one kidney is healthy and the other the seat of tuberculosis.

If up to the time of this test, despite suspicions of renal tuberculosis, all previous examinations of the voluntarily voided urine have failed to show tubercle bacilli, it is now well to allow some drops of urine from each ureter catheter to fall into separate culture tubes of different media, and also, to collect enough additional urine from each gland to permit of guinea-pig inoculations.

When the diagnosis of unilateral renal tuberculosis is satisfactorily established and evidence of similar foci in other organs is absent, the most debated question, namely, that of treatment, is now to be met. We must here be content with the brief and general statement that for the majority of cases the best outlook lies in a nephrectomy and, if possible, a change of air and an improved hygiene of a month or two should anticipate the operation. In exceptional instances much more extended resource to the same measures and periodical oversight by the same medi-



cal adviser may very rarely be attended by the happy results of a disappearance of tubercle bacilli and all the original symptoms.

Nephrectomy for tuberculosis should always be done extraperitoneally, no matter what incision is selected to approach the kidney. Different indications, such as the size and position of the organ, as well as conformation of the patient in individual cases, besides the views of different surgeons as to how much or how little of the ureter is to be removed with the kidney, are the determining factors in regard to whether the incision be a lumbar, an anterior vertical or a sub-costal one. Again various combinations of any of the three are also commonly employed. Briefly stated it may be said that the first mentioned operation is suited to small kidneys, where only an inch or two of the ureter will be removed; that the second supplemented by more or less of a right-angled cut extending outward is well adapted for ureteric management; and the third meets the requirements in many average cases. The two last mentioned incisions do away with the necessity of maintaining the patient in a flexed lateral posture where the well kidney is sure to be more or less compressed by the body weight against the underlying sand bags or air cushions. Whatever incision is employed, after the cutaneous and muscular wound is well advanced and all vessels ligated, the transversalis fascia is severed at the posterior angle of the wound, the perirenal fat appears and two fingers are inserted and directed anteriorly to strip the parietal peritoneum so that it falls toward the median line, the knife follows at a safe distance from this receding tunic. The ureter is now sought by the finger and its condition tested. In the majority of cases its division three inches from its renal attachment will suffice.

To prevent tissue soiling when this is done gauze is led under the duct about which a single ligature is now tied on its renal side, while a pair of pressure forceps are applied to its periphery on the vesical side. The soiled scissors are discarded after cutting the ureter, between the ligature and forceps, and the mucous lumen of both ends cauterized, that of its distal end is cauterized to the distance of half an inch or more, by insertion of the small platinum point. If not easily accessible for the actual cautery, a small swab, moistened with a strong carbolic solution, is twisted into the ureter for a short distance. I generally use a very small curette for denuding the mucosa of the distal end. After the lining has been treated, by any of these means, so as to insure a subsequent coalescence of the tube at or below the point of ligature a knot of chromicized catgut is tied. I am well satisfied that when extra precautions of this kind are not taken to secure adhesive occlusion of the ureter, the ligature alone will prove inadequate in preventing leakage upward from the bladder in fully thirty per cent. of nephrectomies. We have been too prone to ascribe to the vesical outlet of the ureter great sphincteric powers. While such a muscular

mechanism may pertain and be thoroughly adequate in the normal organ the vast majority of cases requiring nephrectomy for disease have a corresponding ureter which has undergone pathological changes at some point in its continuity, most probably at its vesical termination, as can so commonly be seen at the time of a preliminary cystoscopic examination.

The ureter having now been disposed of, the remaining part of the pedicle receives attention. When accessible for the purpose separate chromicized catgut ligatures are placed upon the large vessels, and the kidney cut loose. Not uncommonly the size of the kidney and its liability to rupture, or the indurated condition of the attached part of the ureter, will make it easier to seize the pedicle as a whole, with one or several clamps, then cut the kidney free before isolating the vessels for ligation. Under such circumstances, however, although the space occupied by the kidney has been gained, the marked retractile tendency of the pedicle besides being more or less anatomically distorted and concealed by the clamps, makes separation of the vessels for ligation now quite as difficult as before. Since the renal artery can nearly always be readily identified by its pulsation, I like to get a well-placed ligature at least on this one vessel before separating the kidney, even if the other vessels are intrusted to clamps until after the kidney is detached.

#### HOOKWORM DISEASE AND MINERS' ANEMIA IN THE ANTHRACITE COAL FIELDS.\*

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It has been known for a number of years that there is a certain severe and widespread disease among European coal miners, known as miners' anemia, which is caused by the intestinal parasite, *Anchylostoma duodenale* or hookworm. The disease is, therefore, communicable and in some mines has spread to 95 per cent. of the men employed.

So much has recently appeared in American medical literature on the general aspects of hookworm disease, on its mode of spreading, and its symptomatology, that in the present contribution only those phases of the disease especially connected with mining will be taken up.

The old world variety of the parasite was discovered in Italy by Dubini in 1843. A short time afterward, the worm was shown to be the cause of the so-called Egyptian chlorosis and, later still, to be the cause of an epidemic anemia in Brazil. The disease, however, did not attract much attention until work was begun on the St. Gothard tunnel. Here it was observed that the

\* Studies from the clinical laboratory of the Moses Taylor Hospital.

Italian workers in large numbers suffered from a disease marked by anemia and general debility by which many were incapacitated for work. Peroncito and others investigating this malady found that it was due to this same parasite of Dubini and that the tunnel workers were infected to a very large degree. In a few years it was spread by returning workers all over Italy.

These Italian laborers are supposed to have first carried the disease into the Hungarian coal mines. Here it spread until at present in some of the mines, as for instance in the Chemnitz district, 95 per cent of the miners are infected. From Hungary, the disease spread to Germany. It is said that in the district of Westphalia there are about 25,000 miners affected. At a meeting of miners' representatives from all coal-mining countries of Europe, held in Brussels in 1902, this subject was especially discussed by the German delegates, who claimed that, as the result of the ravages of this parasite, the average duration of a miner's life has fallen from forty-five to forty years since 1896.

From Germany, the disease is supposed to have reached Belgium. Romme<sup>1</sup> states that in Belgium the Institute Bacteriologique found that among 10,000 miners examined, 55 per cent. were infected. The affection has been so serious in Belgium that at Liege it has been found necessary to establish a special dispensary for the treatment of ancylostomiasis. This, with improved sanitary arrangements at the mines, has considerably reduced its prevalence in this country.

In France, the situation is a little less clear. Breton,<sup>2</sup> of the Pasteur Institute of Lille, states that in the Loire basin five per cent. of the miners are infected and at St. Etienne about two per cent. Breton further makes the interesting statement that Halle in 1802 described an epidemic form of anemia among the miners at Anzin, France, which corresponds exactly to ancylostomiasis. It was attributed to bad ventilation. In 1875, a medical society in the Loire basin also investigated a form of anemia and came to a like conclusion. Riebault,<sup>3</sup> too, writing in 1861, described a disease closely resembling ancylostomiasis which he called *anemia d'Anzin* and considered to be epidemic. Breton believes that the extent of the disease in France was formerly much greater than at present, and that it has been reduced to the proportions he indicates. Recently, however, the French Service des Mines stated as a result of an inquiry of their own that the disease is not present in the French mines. This conclusion seems improbable and is discountenanced by Breton.

In England the situation is very interesting. Boycott and Haldane<sup>4</sup> have investigated a widespread form of anemia present in the Dolcoath mine in Cornwall. These observers consider that practically all of the seven hundred underground workers are infected with ancylostoma. They found the ova in the stools of 38 out of 46 miners examined. They believe that the disease was introduced into the Dolcoath from the Colonies,

probably South Africa, and that it has been spreading through the mine for about eight years. The Dolcoath is a metalliferous (tin) mine, but the physical conditions, so far as this worm is concerned, are practically the same as in coal-mines. Thorough examination of other mines in England have not as yet been reported.

Stockman<sup>5</sup> reports a case in a coal-miner, in Lanarkshire, Scotland. This man had previously served two years in the army in India, and undoubtedly contracted the disease there.

The spread of this parasite through mining regions is easily accounted for by the life history of the worm itself and the sanitary conditions favoring it in practically all mines. The infectious material is of course fecal matter. This in many cases contains innumerable ova. When the fecal matter is deposited on the ground under favorable conditions, the ova develop into larvæ which are infectious for men. These larvæ when taken into the mouth develop again into the adult organism. There are certain physical conditions for the development of the eggs which the mines supply very nicely. The eggs require a temperature of 20° to 40° C. and a certain amount of moisture. Bruns<sup>6</sup> has shown that in German and Hungarian mines where the underground temperature is from 25° to 30° C. the disease is prevalent. In other mines having a temperature of 19° to 20° C., the disease is very infrequent or entirely absent. The temperature of our anthracite mines generally ranges from 25° to 40° C. The coal dust lying in the mines forms a very good material in which the eggs can grow. In fact, Goldman<sup>7</sup> and Loos, quoted by Goldman, used coal dust or charcoal to develop the ova experimentally.

The peculiar sanitary conditions which favor the spread of the parasite are these. None of the anthracite mines in this country and only a few coal-mines in Europe, have any privy facilities under ground. The men deposit their excreta in any chamber or gangway handy. If any of the men have the disease, the eggs in their feces will develop, and another man stepping into this material will get some of the infectious larvæ on his boots and transmit them to his hands and then to his mouth. Or, a man can directly contaminate his hands while at work and easily transmit the larvæ to his food, especially if, as is often the case, the worker eats his dinner in the mine, without, of course, washing his hands. The man may not only infect himself in this way, but also may take home the infectious material to his family, as has frequently been observed in Europe. In many of the European mines where ladders are still used to a considerable extent, the possibility of infection is very intimate. A miner walking in infected fecal matter scrapes it off on the rounds of the ladder as he ascends and another miner directly soils his hands in climbing after him. In our anthracite mines, ladders are very seldom used, so that this one element of danger is not present. There is considerable evidence now that the larvæ some times gain en-



trance through the skin. If this mode of infection is possible, it is not the important one in the case of miners.

While several American clinical observers have described a form of anemia closely corresponding to that caused by this parasite, it was not until 1893 that Blickhelm first recognized the true nature of a case in the United States. From this time up to 1892, about 35 cases had been recorded, according to Stiles, in various parts of the United States, some being found in northern cities, such as Philadelphia, Albany, Buffalo, and St. Louis. It was not until 1902, however, that Charles Wardell Stiles,<sup>8</sup> of the United States Public Health and Marine Hospital Service, showed by a series of interesting observations that the disease is very widespread in all our Southern States and that it is due to a different variety of the same parasite that causes the disease in Europe. This variety Stiles had discovered a short time previously and called *Uncinaria Americana*. Further reports now show that the disease is also very widespread in Porto Rico, Cuba, the Philippines and Hawaii.

The wide extent of this disease, then, in foreign coal-mines, in our Southern States, and in our insular possessions makes an inquiry as to its presence in our own coal-mines of some importance. Stiles apparently first drew attention to the great economic meaning of this parasite which won for it in the lay press the somewhat significant title of the "bacillus of laziness." He showed how marked an influence this blood-sucking parasite must have on the productive power of a large portion of our Southern whites. This factor is already being felt in European mines and if this disease is present or threatens our coal-mines its economic importance is great.

We have, then, a disease which tends very particularly to spread through mines, and one which is already very prevalent in countries from which many immigrants come directly to our coal-mines. Further, we know that the disease is widespread in our own Southern States and that it is sometimes found, generally in imported cases, in our Northern cities. Sonsino, quoted by Perroncito, gives 50° 31' north and 30° 5' south latitude as the limits in which the disease may be found. Furthermore, it is very prevalent in our islands and is frequently brought to us by returning soldiers. Garrison, Ransom, and Stevenson,<sup>9</sup> found the hookworm in 10 out of 59 examinations of returned Philippine soldiers. The same may be said of the soldiers returning from Porto Rico. Ashford and King<sup>10</sup> consider that 90 per cent. of the agricultural people and 50 per cent. of the city dwellers in Porto Rico have hookworm disease.

Goldman and Bruns have shown that the worms live in their human host for an average of six years, so that for this time every infected immigrant or returning soldier is a possible focus of infection.

It is evident, then, simply from this brief review of the literature of the subject, that, if this disease has not already spread among our coal-

mines, its introduction is only a question of time. Stiles has already found one case in a miner in South Carolina. This case, however, does not throw very much light on the disease as connected with mines as the worm is so generally distributed in this State.

In order to obtain some definite information on this subject, we have examined the stools of 400 anthracite mine workers. These specimens have been collected from such widely separated cities as Scranton, Carbondale, Forest City, Pittston, Wilkesbarre, Kingston, Sandy Run, Hazleton, and Lansford. At fifteen mines from 10 to 40 specimens were examined, while the rest were from single cases, as they were found in various miners' hospitals, and therefore widely scattered through many mines. The nationalities examined included all the mixed population found in our coal fields, i.e., Welsh, German, Hungarian, Italian, Russian and German Poles, Lithuanians, Magyars, Slavs, etc. The usual technic for this work was followed—ten cover slips being examined in every case before a negative finding was accepted.

Out of all this number (400) the hookworm ova were found only once. This case was a miner in Scranton, but, unfortunately, through a mistake in labels made by one of the miners, the man himself could not be traced. Stiles, who kindly examined this specimen for us, considered that the ova belonged to the old world variety. Fifty other men were examined at the same mine with negative results.

Another almost equally important finding was the larvæ of *Strongyloides intestinalis*, i.e., the organism of Cochinchina diarrhea. This occurred in a native of Russian Poland in our own wards. He had been a farm-hand in the old country and had been in the United States only a few days before an accident brought him to the hospital so that the organism must have been imported with the patient. He was also infected with *Ascaris lumbricoides* and *Trichuris trichiura*. He had no anemia or history of diarrhea. This is, so far as we can discover, the first time that either the hookworm or *Strongyloides intestinalis* has been found in the anthracite coal fields. Boggess found the ova in an Italian brickmaker, who had been working in the soft coal fields of Pennsylvania for one month.

The exact clinical and economic significance of *Strongyloides intestinalis* has not been made out. Perroncito<sup>11</sup> and others frequently found the organism among the workers at the St. Gothard tunnel, both alone and associated with *Anchylostoma duodenale*. Perroncito was of the opinion that the *Strongyloides intestinalis* could of itself produce an anemia. Thayer considers that this idea is disproven and that the parasite may, under certain circumstances, infest man with no harm, while, under other circumstances, it may cause a chronic, wasting diarrhea.

Our knowledge of *Strongyloides intestinalis* in the United States is very limited. It was not until 1901 that Thayer<sup>12</sup> reported the first three cases

found here. Moore described what he considered the fourth case in *American Medicine*, for May 30, 1903. Brown, however, had published an account of three other cases in the *Boston Medical and Surgical Journal* for May 28, 1903. During the year 1903, a number of other cases were reported in the United States, and it is very probable that the parasite is much more widespread than has formerly been considered the case.

It is of interest to note in passing that, among the 400 miners examined, we found 44 different parasitic infections, as follows:

Hookworm .....	1
Ascaris lumbricoides.....	15
Trichuris trichiuria.....	24
Oxyuris vermicularis.....	3
Strongyloides intestinalis.....	1
Total .....	44

This infection was distributed among 37 individuals, as in seven the ascaris and trichuris occurred together. This figure, about ten per cent. of cases, is about the same as Garrison, Ransom, and Stevenson found among soldiers before the Spanish War and is probably a fair average for a working population. The incidence of parasites, however, varies in different nationalities. Thus, of six Italians, railroad laborers at Scranton (not included in the above 400), all were found to harbor parasites, two having *Ascaris*, two having *Trichuris*, and two having both. Recently, an Italian in our wards was relieved of eight round worms and also contained the *Trichuris*. It is probable that, in general, infection with *Trichuris trichiuria* is slightly higher than here shown, as the ova are often very scarce. In some cases, we found only one or two ova in ten slides examined. The ova of the round worm on the other hand are generally so numerous as not to be easily overlooked. In one case we counted 49 round worm ova under a three-quarter inch cover glass. In our own hospital wards, containing as they do a very large foreign element, we can demonstrate a case or two of round or whipworm nearly any time we so desire.

So far, then, as this inquiry has gone, it would show that the hookworm has not obtained much foothold among our anthracite miners, although its presence to a certain extent is demonstrated. The material so far collected, however, does not allow of a definite knowledge of the facts. Hence a much wider search is being carried on. It is possible, of course, as the work progresses, that a single mine may be found, as the Dolcoath mine in England, where the disease has spread extensively and where remedial measures will be necessary.

One interesting finding in this connection is the fact that practically all the mine mules are infected with an organism so closely allied to the human parasite that it can be inferred from its constant presence in mules that our mines present favorable conditions for this family of worms. It is not probable that the mule organisms are transferable from the animals to men. We have

not succeeded in infecting guinea-pigs with this worm from the mule, and we have examined five mine-rats' stools without finding anything except a variety of tapeworm.

In any event, the danger of this disease coming into our coal-mines is great, and, when once established, its effect on diminishing the earning power and probably also reducing the average length of life makes it a very important question, for both miners and employers. However, no aid in keeping out the disease can be expected from the miners. Many individual workers have strongly objected to the present inquiry among them and have refused to send specimens. And, too, our miners are so negligent of the rules to prevent the most immediate serious accidents that they cannot be expected to interest themselves in the prevention of a disease so unsubstantial that even a physician has to use a microscope to find it.

The only way probably by which the disease can be kept out of anthracite mines is, as has been suggested by Stiles, for either the State Bureau of Mines or Health to have the stools of newly employed miners carefully examined. The expense of this method will probably prevent its ever being employed as a distinctly prophylactic measure, though the serious economic loss to the state when the disease does become extensive would amply justify it.

We wish to thank Dr. Stiles for verifying our finding of the hookworm and *Strongyloides intestinalis*.

The American and foreign literature on *Anchylostoma* is now very large. Appended are a few references of more importance in regard to the mining industries.

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**Bubonic Plague Spreading.**—The bubonic plague is spreading in an alarming fashion along the west coast of South America. The State Department received a cable dispatch last Wednesday from United States Minister Wilson at Santiago de Chili, that the plague had broken out at Antofagasta. This is one of the most important shipping ports on the west coast north of Valparaiso. The Public Health and Marine Hospital Service will be advised, so that suitable precautions may be taken at quarantine.



# WHEN AND HOW SHALL WE OPERATE FOR OBSTRUCTING HYPERTROPHY OF THE PROSTATE GLAND?\*

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As a discussion on the treatment of the various phases of obstructing hypertrophy of the prostate gland is the evident purpose of this meeting, it has seemed to the reader that he can perhaps do his share in opening such a discussion, in no better way than by presenting a brief formulation of his own experience and beliefs relating to the question under consideration. Such a brief résumé is all that this paper will attempt, and it has seemed best that he shall confine himself to a consideration of the indications for the various forms of treatment, making little reference to the technic of the various operative procedures at our disposal. The title of these remarks, therefore, is, "When and how shall we operate for obstructing hypertrophy of the prostate gland?"

In the first place let us consider the "when." As far as prostatic surgery is concerned the last decade seems to have been an era of technical progress which has resulted in the development of a variety of operative procedures, and it may now fairly be said that not only are operations for the radical removal of obstructing prostatic masses easily possible, but that they are possible with a surprisingly small traumatism to structures contained in the prostate gland and contiguous to it. If the literature of these years may be taken as an indication of the trend of progress, it at least surely indicates that such progress has been along the line of surgical technic, and after reviewing it, one might almost be excused for inferring that all prostates ought to be removed after the onset of troublesome symptoms, with the same prompt alacrity which characterizes our attitude toward the troublesome appendix. This is, of course, far from being the case, and even the most radical among us will probably, up to a certain point, concede to the catheter much the same place in prostatic therapeutics which it has always held. Its usefulness is as great as ever, greater, in fact, for its better construction and its more varied form make its possibilities for palliation more extended than ever before; and it probably meets the necessities of a wider range of prostatic sufferers than is palliated or cured by any other one procedure. This I believe to be true now, and probably always will be true.

The catheter is useful "up to a certain point." Then its further use becomes abuse, and unnecessary abuse, for the last few years have developed for us various measures which render such catheter abuse no longer necessary, as it was a quarter of a century ago. Where, then, is that "certain point" up to which the catheter is useful? There is a class of prostatic patients in

whom the obstruction has reached a point where it is necessary to empty the bladder one or more times daily, and yet where, because of the patient's ignorance or of the lack of decency and cleanliness in his surroundings, it seems manifestly impossible to institute a proper routine use of the catheter. There is another class of cases where daily emptyings of the bladder are necessary and where the patients are absolutely unwilling to embark upon a catheter life, preferring to take the immediate risks of an operation rather than to incur the tiresome routine and more remote dangers of a catheter existence. Both of these classes are not only proper subjects for radical operation, but usually offer the most favorable conditions for such a procedure, as they are taken so early in the development of the obstructive symptoms; and the writer has several times enucleated obstructing prostatic masses from patients of this kind without making any previous attempt at catheter palliation.

There remains, however, a very large class of cases, many of them absolutely and obviously unfit subjects for operative measures, and all of them easily made comfortable for the time being by the routine use of the catheter. If such patients are properly supervised and cared for during the time when catheter life is being instituted, and up to the time when the urethra and bladder have acclimatized themselves to the new conditions of a catheter existence, they will often go through their lives with a sufficient degree of comfort and an ever-decreasing risk to the integrity of the bladder and kidneys. These are the cases which can properly be treated by the catheter, and so long as these conditions of comfort with steadily decreasing risk of infection pertain, the catheter remains the proper means of palliation. When for any reason these conditions are no longer possible and the catheter ceases to be an easy and efficient palliation, we reach that "certain point" where its use ends and its abuse begins. That is the moment when operative relief should be sought—then, at once—and not after months or years of exhausting struggle, to avoid an operation which was apparently unavoidable when the catheter ceased to palliate; a struggle carried on at the expense of pain, exhaustion and deterioration of the involved organs, even to an extent sufficient to materially lessen the prospects of a favorable outcome. So much for the "when."

Now let us consider with equal brevity "how" these cases shall be operated upon when the necessity for an operation has once been decided. Since Mr. Arthur McGill, of Leeds, published his cases of suprapubic prostatectomy, in 1888, the surgical world has been actively interested in prostatic surgery, and during the fifteen years just passed much progress has been made and much valuable experience accumulated. Prostatectomy, from being a slow, bloody, and inaccurate procedure carried out by the aid of cumbersome instruments, for the most part in the dark, has come to be a quick process of enuclea-

\* Paper read before stated meeting of the New York Academy of Medicine, Dec. 17, 1903.

tion accurately performed under the guidance of the surgeon's visual, as well as tactile, sense. These technical improvements in the forms of operation have been marked enough to lessen materially the mortality of the procedure, and yet, surgeons have been so engrossed with the technic of the operation, and have been so satisfied with the technical advances made, that cases for operation have many times been chosen with a lamentable lack of discrimination, and we are at the present moment quite unprepared to state just how great, in properly selected cases, the real dangers of these radical operations are.

In short, it would seem to the writer that the real problem in radical prostatic surgery at this moment is the selection of the proper case, rather than the selection of this or that method of operation. Certainly few elderly men are good surgical risks and few surgeons are in the habit of performing operations of any severity upon such patients unless they be operations of real necessity rather than those of expediency. Prostatectomy no longer offers the formidable 15 to 20 per cent. mortality which it did a few years ago, but it is and must always be a serious and dangerous procedure, to be offered only to patients who are fair surgical risks, for other less serious measures for the promotion of comfort and the palliation of pain are within our reach as alternatives for the very large class of cases obviously unfit or unwilling to take an anesthetic and undergo an operation of importance. There are many prostatics whose obstructive symptoms develop at so early an age and who reach the limits of palliative treatment so early in the history of their troubles that operation becomes a necessity while they are still comparatively vigorous men in good physical condition. There are others, older men, who, in spite of advancing years, maintain the physical characteristics of those much younger than themselves. These are the cases for prostatectomy, and while it is very difficult to describe accurately just which cases come into this class, and while it is certainly impossible to take the age of the patient as the guide to such classification, the decision will be readily enough reached in any individual instance, provided the surgeon always realizes that he has another alternative for that case, if he does not quite like to assume the risks of a radical operation.

It is, then, the writer's firm belief that while prostatectomy is always the method of choice when possible, because it is the only operation which really offers a prospect of cure, and while there is a large class of patients upon whom it may properly be performed, still those cases form a comparatively small percentage of the total number demanding relief; and while the future developments of the operation will undoubtedly increase its effectiveness and will diminish its mortality, that mortality will be decreased to an even greater extent by a proper discrimination in the choice of cases for operation, a discrimination which has not pertained up to the

present time. There remains, then, another large class of cases, if the writer's estimate of the conditions be a true one, who are, obviously, unfit surgical subjects and many of whom are running an unjustifiable risk merely in the taking of an anesthetic, and yet palliative treatment with the catheter is no longer possible or has never been possible for them. What is to be done for them?

It is impossible to study the experience of the last few years with the Bottini operation and its modifications without realizing that whatever may be the scope and degree of its usefulness, it is certainly a far safer procedure than the more radical operations. The writer has been for years very skeptical as to its usefulness and occupied the very irrational position of those who, while having no personal experience with the operation, still condemned and did not use it. The following case compelled an interest in the operation which further experience has developed into the conviction that it has a wide field of usefulness. The patient in question was under ether anesthesia for a prostatectomy which was to be carried out in the hope of relieving a condition which had resisted all efforts at palliation. The man was an unfit surgical risk and, shortly after full etherization was attained, collapsed, and the operation had to be discontinued. A few weeks later, under local anesthesia with four per cent. cocaine and with the Bottini instrument as modified by Young, of Baltimore, three incisions were made. There was practically no period of convalescence, and in forty-eight hours the man was passing his urine sufficiently for his own comfort. He is now, a year or more later, doing his day's work, using no catheter, and his bladder contains only a few drams of residual urine.

Further experience with the operation has increased the writer's belief in it. It must of necessity be a far less certain procedure than prostatectomy, and it must always be regarded as a palliative measure resorted to in cases where the more radical operation is not safe; but with every recognition of the limitations of the use of the cystoscope in such cases it seems to me that cystoscopic and other instrumental examination will usually give the operator a sufficiently accurate idea of the conditions, to make the operation anything but the "step in the dark," which so many surgeons choose to characterize it. I also believe that the interchangeable knives of the instrument, as modified by Young, make the operation safer, as well as more accurate. My idea of the operation, then, is that it is attended with little risk to life because it needs no general anesthetic and because it has so short a period of convalescence; and, while its results are less certain than those of prostatectomy, they offer the patient a prospect of such a degree of improvement as shall at least do away with any further necessity for the systematic use of the catheter, and to give the operation a large field of usefulness in cases where prostatectomy cannot be safely carried out. I also believe that these cases



form a far larger class than those suitable for prostatectomy.

The writer is quite aware that these remarks are merely statements of his own personal experience and convictions and they must be so taken. If they meet with favor, they may at least serve to coordinate and arrange the ideas of other writers. If they do not represent the beliefs of others, they will serve all the better to promote the discussion, which is the object of this meeting. The points which these remarks desire to emphasize are:

(1) That the catheter has as wide a range of usefulness as it ever had, in the palliation of obstructing prostatic hypertrophy.

(2) That the various operative procedures at present at our command are to be resorted to, with the exception of certain small classes of cases referred to in these remarks, after the catheter has ceased to palliate.

(3) That the time for this operative interference is at the moment when the catheter has ceased to palliate and not after months or years of further and unavailing struggle to make it do so.

(4) That the more radical operation of enucleation, on the one hand, and the Bottini operation with its various modifications on the other, are not procedures of the same kind, do not have the same object in view, and are in no sense to be weighed in the balance, the one class against the other. They should rather be contrasted, the one class as radical operations aiming at a cure, and the other as efficient palliating procedures, each having its own distinct indications for its appropriate use.

#### REFLECTIONS ON THE SURGERY OF PROSTATIC HYPERTROPHY.

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IN this paper, I shall simply describe the methods that I now employ in the treatment of patients suffering from hypertrophy of the prostate gland and its sequelæ. I shall not discuss the various operative procedures that have been recommended for the relief of prostatic hypertrophy; neither shall I consider the advice given by various authorities or the many theories and operative procedures elaborated by them. My excuse for giving my personal experiences to the profession—when that experience is so limited—is that the great majority of the recent original articles, although full of advice and methods, are practically without the relation of actual experiences and the detailed reports of cases. I should be pleased to see a report, from several of our representative surgeons, stating briefly the condition of the patients when they applied for treatment, what was done for them, and the result obtained.

I am of the opinion that infection is the all-important consideration in the treatment of prostatic hypertrophy. A man will, in many in-

stances, suffer the difficulties that he experiences in urinating and the calls to urinate at night, without complaint; and he will usually obtain prompt relief, through the services of his family physician, from complete retention; but when his urinary tract becomes infected, as it usually does sooner or later, he considers his illness seriously and demands relief from his suffering. In my experience, the history of these patients is as follows: They consult a physician, for the first time, when symptoms of complete retention are present. These are relieved usually in one of three ways: Sometimes a sitzbath and hot applications are sufficient, the catheter may be successful, or a suprapubic puncture may be necessary. No matter which method is used, the patient often experiences relief for some time, provided infection does not occur. The marked improvement that sometimes follows when patients have been subjected to suprapubic puncture has been studied by E. Goldman (*Beiträge zur klinischen Chirurgie*, Band xxxi, Heft 1). He believes that the adhesions resulting from the puncture elevate the bladder and diminish or obliterate the retroprostatic vesicle pouch, enabling the bladder to empty itself more completely. Working on this principle, which I believe to be mechanically correct, he has done ventrovesicofixation with some success.

When infection does occur the patient's life becomes miserable. The cystitis may be relieved by irrigation and internal medication, but usually his symptoms gradually progress in severity until he receives surgical relief or else succumbs. The only deaths of unoperated patients that I saw from prostatic hypertrophy resulted from infection and its consequences. These were two Christian Scientists who refused surgical aid.

In discussing the surgical treatment of these cases I shall divide them into two classes: (1) cases in an extreme condition, and (2) cases with sufficient vitality to withstand a radical operation. In the latter variety, I perform perineal partial prostatectomy as follows: The patient is prepared for operation and placed in the lithotomy position. A hypodermic injection of morphine and atropine is given one-half hour before the patient is anesthetized. After he is asleep, a grooved staff is inserted into the bladder. A median incision, about one and one-half inches long, is made in the perineum. The membranous urethra is cut and the incision carried into the prostate nearly as far as the bladder. The index finger is then inserted into the bladder as the staff is withdrawn. The interior of the bladder is explored and the prostate drawn down. If necessary, the perineal structures can be separated laterally with the index finger of the other hand. This permits the prostate to be drawn still more superficially. Subcapsular enucleation of the prostate excepting that portion lying anterior to the urethra, is then done with the index finger. A fenestrated rubber tube, one-half inch in diameter, is passed through the wound into the bladder and is fastened to the skin with a safety

pin. Gauze is packed lightly around the tube and a dressing applied. The patient is propped up in bed as soon as he has recovered from the shock of the operation; the gauze is removed at the end of thirty-six hours and the wound is not repacked. The bladder is not irrigated. The tube is removed as soon as it can be determined that the urine is nearly free from pus—from four to twelve days—depending on the severity of the infection. After the perineal wound has healed, sounds are passed into the bladder to prevent stricture.

The advantages of this method are: (1) The operation can be performed very quickly; (2) the hemorrhage and shock are slight; (3) the bladder is drained at its lowest point; (4) that portion of the prostate which displaces the bladder upward, distorts the urethra and prevents complete emptying of the bladder is removed. I shall now consider the method more in detail,—following the eleven cases that I have operated upon in this manner.

*Anesthetic.*—Nine of the eleven patients operated upon were anesthetized with chloroform. In two instances ether was used. In these cases there was no contraindication to the use of chloroform but, as I was not sure of the skill of the anesthetist, I felt safer in using ether. Nitrous oxide, followed by ether, would doubtless be appropriate under these circumstances, although I have not used it. In all of my cases the anesthetic was taken without difficulty and was followed by no unpleasant symptoms.

*Time of Operation.*—I consider that long-continued operations are not tolerated by prostatics in a weakened condition, and that the operation should be done as quickly as possible. Everything should be in readiness before the anesthetic is started. The operation, as herewith described, can be performed in less than ten minutes. If the prostate is one that requires removal by morcellation, and the patient is in bad condition, no attempt should be made to remove the prostate at the first operation. Perineal drainage will give the patient as much temporary relief as will the radical operation and the prostate can be removed later. I followed this method in one case (*vide infra*).

*Insertion of the Staff.*—This should not be undertaken until the patient is asleep. Great pain and discomfort are experienced by many infected patients when the staff is passed into the bladder. The time saved by introducing the staff before anesthesia is not sufficient to warrant the suffering. In only one case did I fail to pass the staff into the bladder. In this case I cut down on the partially introduced staff and then had no difficulty in getting into the bladder.

*Incision.*—I have found the median skin incision, one and one-half inches in length, sufficiently large to accomplish the objects of the operation quickly. The line of incision involves no structures of importance and affords better drainage than does a transverse incision.

Senn says (*Journal of the American Medical*

*Association*, August 15, 1903) "the median incision so much praised by some surgeons is altogether inadequate in difficult cases." Van Hook says "the incision need not be longer than one inch or one inch and one-quarter. The writer has frequently removed a very large prostate through an incision less than one inch long."

The longitudinal division of the centrum tendinum perineum has the following advantages: It removes the support of the prostate, allowing it to be drawn down into the wound. When the operation is completed, the weakening or loss of perineal support assists in depressing the elevated portion of the bladder, it obliterates more completely the retroprostatic pouch, and assists in completely draining the bladder. Goldman recognized that when the bladder was elevated the retroprostatic pouch was obliterated and the bladder enabled to empty itself. His operation of ventrovesicofixation is based on this principle. E. W. Andrews (*Journal of the American Medical Association*, October 18, 1902) accomplishes the same result by freeing the prostate anteriorly and allowing it to sink into the perineum. Hawley (*Annals of Surgery*, November, 1903) advises removal of the perineal support of the prostate, with drawing down of the organ in order to obliterate the retroprostatic pouch and allow the bladder to completely empty itself. Zuckerkandl avoids the loss of perineal support by dividing the centrum tendinum of the perineum transversely. Van Hook follows his advice. I have seen no unpleasant results following loss of support of the perineum in these operations.

Incision of the prostate in the median line has been done by Jones, of Rochester. I believe that its advantages are these: It easily allows the finger to pass into the bladder, and makes an opening into the capsule of the prostate in a place that is practically free from blood vessels.

Exploring the bladder with the index finger is readily and quickly done. On two occasions I removed stones from the bladder. After the bladder has been explored, the finger should be hooked over the prostate and the organ drawn down. In two cases I separated the perineal structures. This allows the prostate to be drawn down more easily. I have had no experience with instruments devised to bring the prostate into the wound. The finger has served me well for this purpose.

*Enucleation of the Prostate.*—The prostate is removed with the index finger assisted by a bullet forceps or a volsellum, if necessary. The finger is introduced under the capsule of the gland through the median prostatic incision. The capsule of the gland is sufficiently torn with the finger to allow removal of the lobes. I usually remove the prostate in three separate pieces. In one case I incised the capsule of the prostate. It was so resistant that I feared injury to other structures while tearing the capsule. I have had two cases in which it was necessary to remove the prostate by morcellation. In these cases it can be taken out with a cutting forceps, like those advised by



Guyon, or curved scissors can be utilized for this purpose. If it is found that a prostate must be removed by morcellation, and the patient is in poor condition, a tube should be placed in the bladder and the prostate removed later. This I did in one case.

I do not irrigate the bladder in these cases. I am of the opinion that an infected wound or cavity will heal satisfactorily if efficient drainage, in the most dependent part, is provided for; and that irrigation is not only contraindicated, but is harmful under these circumstances.

It is my custom to saturate the gauze that is packed around the tube with compound tincture of benzoin. I imagine that by so doing a film is formed over the exposed tissue that prevents the absorption of urine and septic material. Of course the gauze thus prepared does not drain. This is no objection, as in these cases we wish to drain only the bladder and want to protect the operation wound from infection.

Hemorrhage has caused me very little trouble in doing these operations. The median incision, rapid operating, subcapsular enucleation and quick packing reduce the loss of blood to a minimum.

In three instances the patients suffered from temporary incontinence of urine after they had recovered from the operation. In these cases the incontinence ceased without treatment in three, five, and seven weeks, respectively. The same condition occurred in two of Van Hook's cases. One was relieved by faradism; and in the other the dribbling ceased without treatment. In my cases, the patients urinated normally for about one week. Then the dribbling continued for from three to seven weeks after which time the patients urinated normally. The explanation of this might be as follows: The granulation tissue, distal to the bladder, would not be resistant enough during the early stages of healing to prevent closure of the canal after urinating. Later, the granulation tissue would become so firm as to prevent complete closure of the canal and dribbling result. As the healing became more complete, the new tissue would become pliable and allow complete closure of the canal.

I have had no case followed by stricture, but have passed sounds to prevent this complication. In one case a right-sided epididymitis complicated convalescence. It gradually subsided and gave no further trouble.

My experience with prostatectomy is limited to 17 cases: Four suprapubic prostatectomies—three deaths, one good result. Two cases operated by the combined suprapubic and perineal method—one death and one good result. Eleven operated by the method herewith described, good results following each case.

My first case was done by the suprapubic method. The result was satisfactory. The next two cases were done by this method and both died. I then performed an operation by the combined method and got a good result. The second

case, operated in this manner, died. I then had an experience that meant very much to me:

While in a small town in Iowa I was asked to witness an operation for stricture of the urethra. The operator told me that he was going to do an external urethrotomy and asked me to look the patient over with special reference to his heart. The patient was fifty-six years old and gave the history of a prostatic with infection. Rectal examination, showed the prostate markedly enlarged. When the patient was asleep a grooved staff was inserted into the bladder and cut down upon. Then a rubber tube was placed through the perineal wound into the bladder.

Six months later this same patient came to me and said: "I was well for two months after the operation. Since that time, I feel that my old symptoms are returning." His bladder was slightly infected at this time. I did a suprapubic prostatectomy and the patient died four days after the operation was performed. At this time I decided that if I ever operated on another prostate gland I should provide perineal drainage of the bladder; and if the patient's condition warranted it, I should postpone the removal of the prostate until his general condition had improved. The operator, whom I watched, violated all rules of diagnosis, pathology and surgery, but succeeded in relieving the patient temporarily; my treatment met the pathologic condition, but the patient could not stand it. The two cases that I have operated upon since the foregoing experience are as follows:

*Case 1.*—The patient was seventy-eight years old; was infected and in very poor condition. I decided to simply do a perineal drainage of the bladder. The perineal cystotomy was accomplished so quickly and the patient was standing the anesthetic so well that I decided to attempt removal of the prostate through the incision. I succeeded in enucleating the prostate quickly and easily. The patient made a rapid and uneventful recovery. I have had eight other cases that correspond to this one. The complications and accidental happenings that occurred have been discussed in the foregoing.

The two cases, that required morcellation of the prostate, are as follows: One case was done while I was away from home, on a hunting trip, and I did not have my surgical instruments with me. An ordinary sound was used to replace the grooved staff and the operation proceeded in the ordinary way, until it was found that the prostate must be removed by morcellation. This was done by using curved scissors, artery forceps and a sharp curette. The second case requiring morcellation was in very poor condition. When it was learned that the prostate could not be removed in the ordinary way, its removal was postponed on account of the weakened condition of the patient. A tube was inserted into the bladder. Three weeks later, the prostate was removed by using the finger, bullet forceps and scissors and a Löwenberg adenoid forceps. The operation con-

survived little time and the patient made a good recovery. I have since had a cutting forceps made, on the principal of the Guyon instrument, but have not had an opportunity to use it.

**Conclusions.**—(1) Infection is the all-important consideration in prostatics; (2) perineal drainage of the bladder relieves the patient; (3) many of these patients will not stand extensive operative procedures or long continued anesthesia; (4) partial removal of the prostate, by the method herewith advised, will be tolerated by many infected patients, and a good result obtained; (5) perineal drainage of the bladder only should be done in desperate cases and in debilitated patients in whom morcellation is necessary. In these cases, the prostate should be removed at the second operation.

## MEDICAL PROGRESS.

### MEDICINE.

**Cholelithiasis and Cholecystitis.**—These conditions are most often observed in stout, constipated, inactive women of middle age or older, predisposing factors being indolence, gluttony and constipation, writes C. G. Stockton (Buffalo Med. Jour., April, 1904). The cholecystitis of typhoid fever is the type of freshly developed, uncomplicated infection. Yet even here soft gall-stones containing living typhoid bacilli may be found. In chronic typhoid cases calculi are regularly present. So, given a perversion of the nutrition of, and exudation from, the lining membrane of the gall-bladder, and calculi may be expected. In acute cholecystitis the cystic duct swells and is closed off, the lining membrane pours out an inflammatory exudate and the gall-bladder swells. It may thus project below the liver and may be palpated. The right lobe of the liver is usually enlarged and there may be pericholecystitis with adhesions. Pain may be absent, but there is usually continuous suffering, with paroxysms like colic. There may be fever with chills and sweating, and as a rule there is vomiting, with often constipation and moderate tympanites and jaundice. A leucocytosis even up to 30,000, may be expected, whether the inflammation is suppurative or not. Numerous small soft calculi may be passed during the intervals of improvement. In many subacute cases the pain and tenderness, fever and digestive derangement markedly subside, but the large, elastic rounded tumor is felt below the liver-edge, and may be accompanied by a tongue-like projection of the liver. If the case is protracted, the gall-bladder may become thickened, and retracted so that it cannot be felt, and it may be adherent to liver, omentum, intestine, or pylorus, in each case producing important symptoms or vague disturbances of the stomach and bowels. Patients may go for years without any symptoms sufficiently well marked to clear up the diagnosis, yet always in poor health. They may be treated for stomach symptoms or intestinal symptoms, or from time to time may have gastralgia not at all resembling biliary colic. The most common form, however, is that with recurring biliary colic, and it may be confused with stone in the common duct, or obstruction from cancer of the head of the pancreas. With stone in the common duct the gall-bladder is usually contracted. The colic may occur even when the stone is quite too large to engage in the cystic duct. When in the course of cholelithiasis a severe and continuous pain develops, with swelling and rigidity in the region of the gall-bladder, with great tenderness, fever,

vomiting and retching, and usually considerable tympanites, we have reason to suspect pericholecystitis. In such cases the danger of perforation should always be borne in mind. As to treatment, an operation is not imperative as soon as a diagnosis of gall-stone has been made, but, on the contrary, many will completely recover by medical means alone. Patients should eat simply, drink freely of water, keep the skin active, exercise moderately, avoid excesses, and keep the bowels free; in other words, prevent a lithemic or acid condition. In irritative conditions olive oil in teaspoonful dose every two hours for several days, or salol, sodium salicylate or antipyrin may suffice. For acute attacks, morphine and atropine will be necessary.

**Pancreatic Cysts and Stones.**—In a second, very comprehensive article, P. LAZARUS (Zeitsch. f. klin. Med., Vol. 51, Nos. 5 and 6 and Vol. 52, Nos. 1 and 2) discusses prognosis and treatment of pancreatic cysts and stones. The former if situated in the head are accompanied by more serious disturbance than in the tail. The prognosis is here rendered grave by the loss of pancreatic juice, the gastric and intestinal disturbances, interference with circulation, severe colics and diabetes. A spontaneous cure is certainly the exception; as a rule the cyst soon refills. Less frequent accidents are hemorrhage, suppuration, ileus and intestinal perforation. Of the three possible surgical procedures, puncture should be avoided. Cystectomy is the ideal method but often the deep position of the growth will only permit incision and drainage by means of anterior or posterior pancreatectomy at one or two sittings. The cyst-contents are generally sterile so that there is little danger of infection. Sometimes as much as 500 to 600 c.c. of fluid will discharge in twenty-four hours and the neighborhood of the fistula will often become eczematous owing to the digestive action of the fluid. Another interesting disease of the pancreas is stone-formation which seems to have the same causes as cholelithiasis. Retention is very likely to occur within the ducts since the pancreas lacks the muscular tissue of the gall-bladder and is not in such direct proximity to the diaphragm; though a second duct is present this is generally also implicated in the inflammation. The experimental ligation of large or small portions of the pancreas, never leads to stone-formation since the stagnant juice is rapidly absorbed; a simple infection also gives negative results but if the author combined both, stone eventually formed in cystic dilations. A precipitation of lime salts from pancreatic juice can only be induced by decomposition and by disintegration of epithelial cells secondary to catarrh; these cells and bacteria form the nucleus of the stone which soon becomes encrusted with lime. Rarely stones may also form secondary to necrosis or indurations of arteriosclerotic, alcoholic or luetic origin or after chronic interstitial inflammation. Anatomically a stricture, obstruction or compression of the duct is generally found while the pancreas is the seat of an interstitial process, not rarely with lipomatosis and fat-necrosis. The organic constituents occurring in stones are epithelial cells, leucocytes, crystals of fatty acids and detritus, the inorganic chiefly carbonate and phosphate of lime. The bacteria present are generally colon bacilli or streptococci. The most usual location of stones is the chief duct near the orifice, where they may compress the choledochus, though gall-stones more often compress the pancreatic duct. They occur in all sizes, are frequently multiple and brittle and less often faceted. The most feared complication undoubtedly is suppuration, since it may lead to bursal empyema or perforation into a large vessel with sepsis. It is a strange fact that the relation between stone and cancer is not so intimate as in the case of the gall-bladder, thus cancer is probably the most common disease of the pancreas while stones are rare.



The etiology of stones often points to a simple gastro-duodenitis, but a catarrhal sialangitis may also result from intestinal infections such as typhoid or dysentery, from malaria or from septic and pyemic conditions while an indurative pancreatitis may have arteriosclerosis, lues or alcoholism for its cause. A hereditary tendency probably does not exist and males are affected five times more often than females. An idea of the frequency can only be obtained by post-mortem examinations and the only available statistics gives 1.64 per cent., while for gall-stones the figures are 5 to 12 per cent. The symptomatology presents many puzzling features; often large stones are found at autopsy which have given no symptoms while smaller ones may cause excruciating suffering. The close proximity of the organ to many important structures explains the great variety of symptoms occasionally encountered; those dependent upon the pancreas itself are colic, discharge of a calculus per anum, diabetes and cachexia. The colicky attack is often preceded by digestive disturbances; it is localized under the left costal margin and may spread to the vertebral column and left shoulder-blade. The onset is often marked by a severe chill and followed by reflex salivation and vomiting. Disturbances of circulation such as cardiac weakness and collapse occur here like with other severe abdominal pain. The temperature is never very high; sometimes there is jaundice with swelling and tenderness of the liver and gall-bladder and after the attack a peculiar feeling of hunger and thirst may be complained of. Locally the tenderness is seated in the epigastrium or left hypochondrium, depending upon the position of the stone. It is of the utmost importance to search the stool for stones but considerable patience is required since they may not appear for days or weeks and their absence does not argue against the diagnosis since they are often comminuted in the intestines owing to their brittleness. Diabetes is a frequent symptom of stone, but does not depend on this but upon the secondary chronic inflammation and destruction of gland tissue. Strangely enough the islands of Langerhans which are now regarded as forming a separate ductless gland analogous to the thyroid and hypophysis, seem to be peculiarly resistant toward invasion by fibrous tissues; they may be in every way normal in glands almost completely changed into connective tissue. Their relation to true diabetes has not been definitely settled; they are occasionally present, occasionally absent in this disease and the same is true for the indurative pancreatitis after stone. The character of the glycosuria varies: it may run an acute or a chronic course or may be intermittent with every colic; suppuration seems to exert a favorable influence. The urine is often poor in indican and in the absence of jaundice, the presence of a large amount of fat and of striated muscle fibers form a valuable guide. The cachexia is ascribed to the diabetes and to disturbances of assimilation. Rare symptoms are dyspepsia owing to adhesions with stomach and intestines, bronzing of the skin due to compression of the solar ganglion and aneurism of the descending aorta; infrequent complications are acute pancreatitis manifesting itself by fever, tenderness and continuous pain over the organ; hemorrhage, necrosis, suppuration and carcinoma.

#### HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**A Possible New Form of Mediterranean Fever.**—The clinician, like the rest of human beings, is often too ready to follow the lead of others. PATRICK MANSON (Brit. Med. Jour., March 5, 1904) calls attention to the length of time which elapsed from the discovery of the plasmodium of malaria to the dawn of a knowl-

edge that there was such a thing as Malta fever, a separate and distinct type of disease. He presents the photograph of a spirillum which he isolated from a woman who during her residence of three years in Gibraltar, had enjoyed good health. She was bitten on the cheek, presumably by a mosquito, and the wound behaved very unkindly. Three weeks from the time she was bitten she had a rigor, followed by a temperature of 104° F. After profuse sweating the fever terminated four days later. Ten days later there was a recurrence of the fever which lasted three days, rising again to 104° F. One week later she had a similar attack. In all there were five recurrences. The attacks gradually diminished in severity. In the intervals she was quite well. Two months after the first attack, she miscarried. Morphologically the spirillum differed from *Spirillum Obermeieri* in that the curves, instead of being short and abrupt flexures, were few and graceful. It is by no means out of the realm of the possible, in the opinion of the author, that this may be one of a number of different forms of malarial fever of which Malta fever is at present the only one generally recognized.

**Anatomical Characteristics of *Filaria Perstans*.**—The distribution of this parasite in East Equatorial Africa is said to correspond almost exactly with the area distribution of the banana and of clothed people. Low states that in the virgin forests of British Guiana, in areas where there are no bananas, it exists in 50 per cent. of the aboriginal Indians. H. C. BASTIAN (Lancet, March 5, 1904) discusses the problem as to whether it is necessary for the parasite to have an intermediate host or not; as to the anatomy of the worm and the question of the genus to which it belongs. He enforces the following points: (1) We know next to nothing concerning the internal anatomy of *Filaria perstans* and are therefore quite unable to say to what genus it belongs. (2) It is erroneous to say that nematodes pass through one or more metamorphoses, as they probably attain maturity by a process of steady and progressive development. (3) Nematodes stand in no need of being harbored by intermediate hosts but are from the earliest moment capable of maintaining an independent existence. (4) As a consequence, plants or vegetables, as well as water, are probably the sources through which nematodes enter the human body.

**Presence of Albumin in the Feces.**—Albumin does not occur normally in healthy feces, even when much albuminous food is ingested, but after about fifty grams of somatose traces of albumose and peptone can usually be detected. A. ALBU and A. CALVO (Zeitsch. f. klin. Med., Vol. 52, Nos. 1 and 2) examined the stools in a number of intestinal and other diseases for albumose and peptone, including typhoid, with negative results. Despite undoubted lesions in the intestinal walls, the remaining normal mucous membrane is able to assimilate all albumin. Unaltered albumin, however, was found in 20 per cent. of the gastro-intestinal cases and in these traces of albumose occurs after large doses of somatose. In nurslings all these substances are found more constantly, even in health. It is possible that in many cases the albumin does not come from the food but from the leucocytes and epithelial cells of the mucosa.

**Condition of the Kidneys in Gastro-enteritis of Nurslings.**—It was rather a revelation to M. HOHLFELD (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 3 and 4) to find very distinct evidences of parenchymatous nephritis in all cases of gastro-enteritis and cholera infantum in nurslings which came to autopsy. The kidneys seem to be very sensitive to all intestinal changes, but since the lesions resemble those of intoxications and infections, the etiology is probably the same, since intestinal decomposition products and bacterial toxins

circulate freely in the blood. The bacteria themselves play no part, as they could only rarely be found in the renal tissues and then were not surrounded by reactive inflammation, so that their invasion must be looked upon as agonal or post-mortal. Bacterial infarcts are very rare. In the more chronic intestinal disorders the nephritis is more interstitial in type since an active proliferation of the perivascular connective tissue goes on. Clinically, hydrops and edema are infrequent and moderate, the urine generally contains a small amount of albumin, few white and red cells and more abundant renal cells, hyaline, granular and epithelial casts. The sudden appearance of hematuria argues more for hemorrhagic infarct than for hemorrhagic nephritis. The lesions are least marked in chronic gastro-enteritis and most intense in acute colitis. A thrombosis of the renal vein can only be diagnosed if anuria sets in. The prognosis in general is good if an interstitial process has not yet set in. Therapeutically, subcutaneous saline infusions are particularly recommended.

#### **Bacteriological Examination of Blood After Death.**

—Before it was customary to make blood-cultures during life, the blood was frequently examined bacteriologically after death, but owing to imperfect technic, very unsatisfactory results were obtained, as many of the findings could only be explained by an agonal or post-mortal invasion of bacteria. If the blood is taken from the heart instead of the peripheral veins the cultures will be less frequently sterile in septic diseases since the temperature does not fall so rapidly after death and an active proliferation of bacteria continues for some time. M. SIMMONDS (Virchow's Archiv, Vol. 175, No. 3) has had experience with 1,200 cases and finds the results very reliable. He proceeds as follows: Not later than thirty-six to forty hours after death, the right ventricle is singed with a hot knife and a sterile syringe then introduced. One to twenty drops of the aspirated blood are diluted with a tube full of fluid agar and then plated in the usual way. After twenty-four hours a diagnosis is generally possible, especially since the growth of many germs is characteristic on blood-agar, thus colonies of streptococci can be recognized by their light areola induced by hemolysis, those of pneumococci generally possess a greenish color, while the colonies of colon bacilli are large and tend to spread superficially after they have reached the surface. The findings agreed remarkably with those obtained during life and evidences of a post-mortal invasion could hardly ever be obtained. In almost half of the cases, the blood was found infected and the germs commonly present were streptococci. In about 95 per cent. of the cases only one variety of germ was present, but frequently the plates were so overcrowded with colonies that other forms might have been overlooked. Typhoid and anthrax bacilli occurred only with their respective diseases, pneumococci in croupous pneumonia, exudative pleurisy, meningitis and tuberculosis, and rarely in malignant endocarditis, acute osteomyelitis and suppurative peritonitis; staphylococci in osteomyelitis, pyemia and septicemia, streptococci chiefly in scarlet, diphtheria, phthisis and infections; colon bacilli in diseases of the abdominal organs. From one case of malignant endocarditis, a growth of diphtheria bacilli was obtained. The blood was sterile in acute tuberculosis, polyarthritis, chronic diseases of the heart and arteries and of the nervous system, chronic bronchitis and emphysema and in the newly born. The largest number of bacteria were found with streptococcus, less in coli invasion and very few when pneumococci and typhoid bacilli were present; in the latter case better results were obtained with blood taken directly from the spleen. In 129 cases of scarlet fever the blood was sterile only 39 times; these patients died

during the first three or four days of the disease before necrosis of the pharyngeal mucous membrane had developed. With streptococci there was always a severe tonsillitis, pharyngitis or rhinitis or some suppurative process. In 68 cases of diphtheria, streptococci occurred 38 times, pneumococci once; here also a pathological process in the nasopharynx could usually be detected. For measles the figures are: sterile ten times, streptococci four times, pneumococci once; for phthisis, streptococci 28 times, pneumococci four times, colon bacilli five times, sterile 66 times. Statistics for tubercle bacilli could not be obtained on account of the long time necessary for their growth. It seems clear that mixed infection plays a very prominent rôle in active consumption and ready portals of entry for streptococci are found in the pulmonary lesions and for colon bacilli in the intestinal ulcerations. In cases of pyemia, staphylococci were the usual findings and it seems that these germs more frequently set up embolic and metastatic foci than streptococci—an observation which has also been made during life. Rarely a case of decided sepsis will give only sterile cultures, both before and after death, and it is possible that some anaerobic bacillus was the cause or that the condition was merely an intoxication. Positive cultures with malignant tumors could generally be explained by the breaking down of the tumor and the germ found always corresponded to the situation of the growth. In one case of operated uterine cancer, no breaking-down was found, so that infection during operation and rapid multiplication in the blood-stream must be held accountable. This is probably of frequent occurrence after operations and catheter-fever is most likely also due to blood-infection, but as a rule the germs are excreted equally as rapid. Especially interesting results were obtained in peritonitis. Though the peritoneum forms a large surface with great powers of absorption, sterile cultures were common even where putrid fluid was found in the abdomen, but when the patient had been operated, colon bacilli and streptococci were frequent. The great value of post-mortem blood examinations is evident from the fact, that frequently the cause of death could not be cleared up at autopsy until the presence of streptococci, etc., gave evidence of a sepsis.

**Origin of Plasma Cells.**—The connective tissue of the skin is extremely rich in cellular elements which vary considerably under different conditions. In health the spindle-shaped cells are poor in protoplasm and contain a small nucleus with little chromatin but in chronic infectious processes a marked hypertrophy and hyperplasia of the cellular elements is seen. It is here that plasma cells abound and these can be described best with L. EHRLICH (Virchow's Archiv, Vol. 175, No. 2) as hypertrophied connective tissue cells of more rounded form and more granular protoplasm. Tumefactions consisting chiefly of plasma cells, may be termed plasmomata; these include most of the chronic infectious granulomata and the lesions of a variety of skin diseases. By means of special stains the plasma-cell can now be clearly differentiated from all other elements and then appear as round cells when fully developed, more or less angular or elongated when compressed. Methyl green and pyronin bring out distinct granulations such as are common in pathologically degenerated cells, while polychrome methylene-blue and aniline alum give evidence of a well-marked spongioplasm which fills up the space not occupied by the granules. As a rule, one excentric or two polar nuclei are found with five to eight chromatin bodies of radial configuration and a central nucleolus. Proliferation generally takes place by direct division. In pathological states, degeneration affects the granuloplasm more than the other cell constituents, thus in



syphilis, hyaline changes begin in the neighborhood of the nucleus and gradually extend into the periphery and in edema the entire cell becomes cloudy and loses its dusty appearance. In other conditions, the distribution of the cells is characteristic, as in rhinoscleroma where they accompany the blood-vessels; in soft chancre where they lie adjacent to the superficial necrotic focus and in the hard chancre where they are everywhere permeated by connective tissue strands and in the syphilitic papule where they bear a close relation to the sweat glands. The origin of the plasma cells is traced to the connective tissue by some, to the blood by others, but the author was able to demonstrate conclusively that they are derived from hypertrophic connective tissue cells by means of a series of well-defined transitional elements.

**Relation of Posterior Nerve-root to Spinal Ganglion.**—According to K. KLEIST (Virchow's Archiv, Vol. 175, No. 3) division of the posterior nerve-root will set up a degenerative process in the spinal ganglion which becomes less intense in a centrifugal direction and probably does not extend to the nerve itself unless some peripheral branches are severed during the operation. About one-sixth of all the cells are destroyed; they are situated in the dorsal border and the proximal pole, while the axillary zone and the ventral border remain normal but for a moderate cell-proliferation. The rarefied cells of the dorsal border will eventually be imbedded in connective tissue; the peripheral stump of the anterior root dies off, the central degenerates only partly and develops young nerve fibers. When the nerve itself is divided, the posterior root will show a degeneration which decreases in intensity toward the cord, while the ganglion loses more than one-third of its cells, especially in the axillary zone and the ventral border. Here also a connective tissue proliferation will appear. The anterior root, in distinction to the posterior, shows less marked degeneration and retains the power of regeneration. These facts prove that the majority of posterior root-fibers form an uninterrupted tract from the cord to the peripheral nerves and that the ganglion cells form an effectual barrier toward centrifugal and a less marked resistance toward centripetal degeneration.

**Pathology of Scars.**—The interesting article of R. MINERVINI (Virchow's Archiv, Vol. 175, No. 2) gives some pathological data of importance concerning the various forms of scars. In artificial wounds the degree of retraction bears a close relation to the direction of the connective tissue fibers in the skin; it is greatest when the incision is vertical to these. Within twenty four to forty-eight hours the edges are fixed in their new position by the reactive inflammation. During the period of granulation, the incision will gradually shorten but after cicatrization it will regain its former size and often elongate beyond this. As a rule, slightly shrunken scars will elongate more than those which have retracted considerably. In recent scars the epidermis is well developed microscopically and of almost normal appearance; the connective tissue is still rich in fibroblasts, blood-vessels are abundant but elastic fibers, nerves and lymphatics cannot be found. In old scars, fibrous tissue predominates and elastic fibers have made their appearance but these are few in number and very delicate and only have a lateral connection with the fibers of the surrounding skin. In wounds healed by first intention they are first seen by the end of the second month, in those by second intention by the third or fourth month, and they probably take their origin directly from cell-protoplasm and not from the fibers already present. The number of blood-vessels does not diminish with age but their caliber

becomes somewhat reduced. True lymphatics are also absent during the later stages but a few delicate nerve filaments may occasionally be found. Two processes thus go on in all scars: first a change of embryonal tissue into permanent fibrous tissue, requiring one to two months and secondly, a new formation of elastic fiber and nerves, concomitant with which there is the appearance of dermal papillae. The parts will, however, never be the same as normal skin, for glands, hair follicles and muscles are permanently absent. The functions too, are imperfect for tactile sensation is never as delicate. The histological structure of scars secondary to destructive processes and those found on the abdomen after pregnancy, resembles that of all old scars and should not be regarded as atrophic but traumatic. In atrophic scars, all the structures are imperfectly developed while in hypertrophic scars the lesions resemble those of any scar in the early stages.

**Lesions after Obstruction of Salivary Duct.**—In one case, where the excretory duct of the parotid gland was obstructed by a stone, O. LANGEMAK (Virchow's Archiv, Vol. 175, No. 2) found a connective tissue hyperplasia, in a second, where the obstruction was a longer duration, there was also considerable atrophy of gland tissue. To decide if the stone acted as irritating foreign body or if the lesions merely depended on stagnation of secretion, the author ligated the duct in a number of animals, but obtained exactly the same changes in about the same time. Even when the trauma was purposely rendered more severe the hyperplasia was not more marked. It is probably caused directly by the venous hyperemia and edema which is set up by ligation.

**The Blood in Pulmonary Tuberculosis.**—A study of the blood in patients suffering from this disease has been made by J. M. SWAN (Jour. Am. Med. Ass'n, March 12, 1904). Twenty-five cases of pulmonary tuberculosis are included and one case of extensive cavity formation due to bronchiectasis. The classification adopted is that of Grawitz, who divides the disease into three stages, the first, in which there is a beginning affection of the apex without cavity formation; a second stage in which there are symptoms of cavity formation without fever or with a slight fever; and a third stage in which hectic fever is present. The writer concludes that the blood picture in this affection is not constant. Cases were found in each of the three stages of the disease which were quite out of the limits of cellular and hemoglobin content described by Grawitz. The average case in the first stage of the disease presents a slightly reduced number of erythrocytes, a moderate reduction of the hemoglobin and about a normal number of leucocytes. In the second stage the average case presents a varying degree of leucocytosis, due to an increase in the number of polymorphonuclear neutrophile cells. The erythrocytes are present in about normal numbers, and the hemoglobin is often normal in percentage. In the third stage there is a reduction in the number of erythrocytes, a moderate leucocytosis composed of the polymorphonuclear neutrophile cells and a high hemoglobin percentage. Hemorrhage is usually followed by a marked reduction in hemoglobin, a slight reduction in the number of erythrocytes. Leucocytosis is not an invariable feature of a posthemorrhagic blood. Albuminuria of itself appears to cause no constant change in the blood picture. Tuberculous diarrhea is apparently attended by a reduction of the number of the erythrocytes and of the percentage of hemoglobin and by an increase of the leucocytes. Pleurisy is usually accompanied by a polymorphonuclear neutrophile leucocytosis. There is no distinctive blood picture that will serve to differentiate between extensive cavity forma-

tion due to tuberculous degeneration and that due to other causes. Further, it was also found that leucocytosis is not a constant feature of cavity formation. The leucocytosis occurring in the course of a pulmonary tuberculosis is due to an increase of the polymorphonuclear elements and not to an increase of the lymphocytes or of the transitional cells. The absence of the eosinophile cells from the blood may be looked upon as an unfavorable prognostic sign. The increase of these cells, while the patient is under treatment, may be taken as an indication that the progress of the disease has a tendency to become arrested.

**Resistance of Acid-fast Bacteria.**—In a recent communication a series of experiments is presented by R. C. ROSENBERGER (Medicine, March, 1904), in which he has determined the actual resistance of this interesting group of bacteria to mineral acids and other reagents. He found that in doubtful cases where these bacilli are encountered, a diagnosis of tubercle bacilli can be positively made by after-treatment of the stained spread with sweet spirits if niter or glacial acetic acid, as these two reagents completely decolorize other acid-fast organisms, such as the grass and butter bacilli and the smegma bacillus. The author claims that inoculation experiments should always be made where only a few organisms are observed.

**Adenoma of Sweat Glands.**—There is no question that the sweat glands of the skin sometimes undergo adenomatous hyperplasia, though many of the tumors reported in literature are not true adenomata. L. PICK (Virchow's Archiv, Vol. 175, No. 2) has carefully reviewed the subject and finds that beside the intimate relation of these tumors to the glands, there are certain well-defined morphological characteristics. These are a double layer of epithelial lining, simulating that of the excretory ducts, an elastic limiting membrane surrounding the ducts and a lumen filled with excretory products. Three varieties of tumors may be distinguished: Those derived from fully developed glands, those taking their origin from the epidermis or from rudimentary glands, and lastly, mixed types. Occasionally the excretory duct alone is involved (syringo-adenoma) but an undoubted adenoma of the coil alone (spiradenoma) has not yet been described. Upon the vulva, these tumors closely resemble adenocarcinoma. Among other tumors may be mentioned benign epithelial growths and carcinomata which may retain their specific character or closely simulate epitheliomata of the skin.

### EYE, EAR, NOSE AND THROAT.

**Pulsating Exophthalmos.**—The majority of the cases of this distressing condition result from an arteriovenous aneurism of the carotid artery and cavernous sinus. A few are undoubtedly due to spontaneous aneurism of the ophthalmic artery; 71 per cent. of cases follow traumatism. F. W. MURRAY (Ann. of Surg., March, 1904) states that immediately following rupture of the artery, blood escapes into the sinus. The increased pressure interferes with the venous pressure through the superior ophthalmic vein and passive congestion results. The symptoms of this may develop rapidly or slowly, depending upon the opening between the artery and sinus. Characteristic symptoms are exophthalmos, pulsating tumor at the inner angle of the orbit and bruit. The protrusion of the eyeball is in most cases extreme. The lids swell, and become edematous. The conjunctiva is chemotic. Its veins are distended and tortuous. Its circulation is reversed. The vein becomes practically an artery and forms a pulsating tumor above and to the inner side. Sight may be unimpaired, but it grows weaker and blindness will

follow unless the lesion be removed. Subjective symptoms are marked; headache and other cerebral disturbances being the usual cause for the patient's seeking relief. Compression of the carotid affords temporary relief of the symptoms. Ultimately, unless treated, these cases all go on to a loss of sight, with the exception which proves the rule, of a few which have gone on to spontaneous cure. The therapeutic measures are limited by the morphology of the parts to a simple reduction of pressure in the sinus so that passive congestion of the superior ophthalmic vein may be relieved. Ligation is the operation of choice and in six weeks at the outside, cure, in successful cases, is complete by this method. It is interesting to note that the general mortality after ligation of the common carotid is probably about 25 per cent. In such ligation, however, in the case of exophthalmic patients, the mortality is not over 10 per cent. Reference to the tables of Sattler and Slomann shows that the percentage of cures were in each case about 50 per cent., the mortality being about 4 per cent. Blindness may result if the operation be done too late. In the tables referred to, the time of its inception was from four to sixteen weeks. Recurrence is more frequent in the traumatic cases. Those patients who are blessed with a low grade of compensatory circulation have the highest chance for recovery. The superior thyroid artery plays an important part in this circulation, and in several cases, it was found, some weeks after the carotid ligation, to be dilated and strongly pulsating. This suggests the desirability of tying the external carotid below the origin of the superior thyroid. This delays the establishment of a collateral circulation. It may occasionally happen that both common carotids have to be tied for the cure of pulsating exophthalmos. There are six cases in all recorded, an interesting observation on them being that they were accomplished without mortality and in five cases there was either marked improvement or cure. In conclusion, the author stated that in his opinion the internal carotid should first be tied, this failing, the ligation and resection of the branches of the superior ophthalmic vein at the inner angle of the orbit should be done, and if necessary a resection of a portion of the main vein. In case of this failing, ligation of the opposite carotid should be instituted.

**Serum Treatment of Hay Fever.**—The claims made by Dunbar for the efficacy of this plan of treatment has led a number of other observers to report their results. A series of ten cases is published by L. S. SOMERS (Medicine, March, 1904) who used the antitoxin made from the serum of animals inoculated with the pollen toxin of goldenrod and employed it in the form of serum and powder. One or two drops of the serum are placed in each eye and nasal chamber whenever an attack of hay fever is expected, or on the presence of any irritation. The dried serum may also be employed, when mixed with an inert powder such as milk sugar, but it can only be used in the nasal chamber. The results in these ten cases proved very gratifying. The serum produces prompt amelioration of the symptoms in the majority of cases and in a smaller number the affection may entirely disappear. Where slight or no action is seen after its use, pollen as an etiological factor does not predominate. When administered in advance of the attack or during the same irrespective of the severity, it produces marked palliation rather than absolute cure. Its effects upon future attacks is as yet unknown. The serum in powder form is slightly soothing to the mucous membranes of the nose, but has little influence upon the other symptoms and in occasional cases may act as a direct irritant.



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## NEW YORK'S INSANE.

THE State of New York has been fortunate in the appointment of two successive Commissioners of Lunacy who have been chosen for their more than ordinary ability to organize and to administer.

The resignation of Dr. Frederick Peterson after but two years' service would have caused consternation among those who had hoped for full fruition from the many reforms which he had started during his brief service, were it not for the fact that his successor, Dr. William Mabon, is another man of high scientific attainments and a worker for ideals.

Dr. Peterson's service has been marked chiefly by the inauguration of careful plans to make the administration of the State Hospitals more complete in scope and efficient in detail. He has endeavored to raise the State Hospitals from the level of custodial institutions to real places in which scientific study of the insane is carried on and in which active therapeutic measures are in use. This scientific idealization of the excellent custodial system of New York State has necessitated many changes which we may be able now, perhaps for the first time, to appreciate as a whole.

In addition to the establishment of 5,147 beds

to increase the capacity of the present hospitals, Dr. Peterson has brought about the segregation of the tuberculous insane, by isolating them first in solariums and tents, and later in three tuberculosis hospitals which have been especially constructed for that end. Appropriations for the construction of ten isolation pavilions for infectious diseases have been secured, and he has made it a part of his policy to insist that every State Hospital shall have a separate pavilion for acute cases of insanity.

Along with this more enlightened and practical classification of the patients of the State in a broad medical way we have been gratified to observe the better means of treatment that have been provided for them, such as the installation of surgical operating rooms, hydrotherapeutic apparatus, and electrical and mechanical therapeutic aids. An improved dietary has been put in operation, with an increased ration allowance over the restricted Atwater dietary that raised such a protest. Nurses and attendants are beginning to receive better wage, making it an object for intelligent people capable of higher training to enter the service.

But apart from the betterment of the patients already under care, perhaps the most valuable work that Dr. Peterson has accomplished is the reorganization of the Pathological Institute on a thoroughly practical and common sense basis. Under Dr. Adolf Meyer original work is going on, relative to the actual needs of the insane, and during the past year a series of seminars have been held in which assistants from all over the State have participated. This thoroughly practical method cannot fail to establish a coordinate system of case examination and be instrumental in introducing some order in the purely clinical aspects of psychiatric study.

Dr. William Mabon, with his work at Willard, Ogdensburg and Bellevue, has had the practical experience that can appreciate the far-reaching value of the changes instituted by Dr. Peterson; and it is a subject of the greatest felicitation that, having found such a man, the State has made the term of service more permanent, and has made a more adequate appropriation for his salary.

How Dr. Peterson was able to accomplish so much in two years, is hard to see, unless it were at the cost of great personal sacrifice; for the plans and problems which he hands on to his successor are such that will take many years to carry out; but if fulfilled, as we have every hope to be-

lieve they will be, the condition of the hospitals for the insane in New York City and New York State will be a source of much pride to their citizens and an example for other communities.

#### "HOW WE APPLES SWIM."

THE desire to convert others to their own particular way of thinking, and the distribution of tracts to further that end seems to be inherent in the American breast. This missionary fad has been rampant among us, since the early days of the Colonies, when one John Tewksbury issued a screed concerning the thirty-nine articles of faith, which was more remarkable for its alliterative and alluring title of "Buttons for an Unbeliever's Britches," than it seems to have been efficacious in remodeling the sterrand rock-bound religious tenets of our forefathers.

From this time the proselyting tide, reinforced with documentary arguments, ebbed and flowed. It rose with the flotsam of hydropathy, faith-cure, phrenology and other medical cults, and it fell with the jetsam of peculiar religious sects. This was probably due in part to the fact that the evangelical enthusiasts were prone to send all collected money to foreign countries for the conversion of the distant heathen, while they left the domestic article to fatten on the tracts alone, and it was also aided and abetted by that firm and unvarying support of patent medicines that seems in most cases to be donned with the clerical frock. This caused a division of interests with a stronger bias toward practice than to preaching, for it is an established fact that there is not a proprietary remedy on the market which is not endorsed by clergymen to a degree that leads to a suspicion among the ungodly that these reverent gentlemen must have led rather frisky lives in their unregenerate days if they are now obliged to take all the nostrums that they extol. It might also tend to the belief that it is only the peculiar virtues of their vaunted drugs that have prevented the curtailment of the straight coat into that of the straighter jacket.

The latest pebble that has been thrown on the beach of controversy seems to be the theory that apples are a cure for the tobacco and drink habits and are also conducive to morality. This appears to be endorsed by both Church and State, and has taken such a firm hold on the convictions of Mr. John T. Stetson, director of pomology at the World's Fair, that he announces that pamphlets setting forth the efficacy of apples, as a cure for bad habits will be distributed with 1,000,000

apples, on "apple day," September 27, at St. Louis. In order to work a cure by the apple diet, Mr. Stetson advises that when one has a craving for a smoke or a drink, that he should take an apple in its place. Just what medicinal property is contained in the fruit, the Director has the honesty to say that he does not know, but he goes on to cite Senator Cockrell's moral life, and high standard of statesmanship, as an incident of the reforming influence of apples. For he says that "it is a well-known fact that the Senator makes his own lunch of apples every day, to the exclusion of all other food, and has kept up this diet for over thirty years." This is, in itself, most interesting corroborative testimony, which, however, is hardly necessary, as it would seem that if a patient could be induced to take an apple (or anything else) every time that he "craved a smoke or a drink," in place of the tobacco or liquor, that little more would be needed.

As to apples as a food, they, in common with the whole category of acid fruits, have little nutritive value. They consist for the most part of water and carbo-hydrates, and are useful simply as a means of correction, for what has grown to be known—for the want of a better name—as "an unbalanced diet." Figuratively speaking, Americans have been charged with "eating too much corn, and too little fodder." Beefsteaks, with their proteids, have proved more tempting, and the starchy foods with their carbo-hydrates have been neglected. The result of this one-sided dietary has been a general dyspeptic feeling of *malaise*, that has not been thoroughly understood, but which has been found by experience that whisky and tobacco will anesthetize if not relieve. This has been most marked among the working classes of Great Britain, where fruit is very scarce and the prices charged for it are very high, and has, according to the London *Lancet* given rise to the belief that the man that was overfond of liquor had small taste for fruit, just as the man who cared for fruit had little liking for alcohol.

In this country, however, we have been more fortunate, if not more sensible, in the mixing of our foods as well as our drinks. Thus the apple has furnished a sauce as well for the goose as the gander, and has long been a foil for the succulent roast pig. Cranberries are always served with turkey and mint sauce has appetizingly tempered the stomach to the shorn lamb, while horseradish has added piquancy to the



rather prosaic beef. So as far as the equalization of digestion is concerned, and its indirect effect on the cravings for tobacco and stimulants Mr. Stetson and his million apples may prove a blessing to the stranger in the gates of St. Louis.

Let us hope, however, that he will not push his remedy to its full therapeutic effect,—for the result of the introduction of fruit,—particularly when immature, into the lumen of the small intestine is sometimes followed by a train of active symptoms that has been described in prose and sung in verse. We are all familiar with the poetical desire to hang Jeff Davis to a sour apple tree, with a subsequent confinement of his diet to the fruits thereof, while the little peach of emerald hue, that was the undoing of Johnny Jones and his sister Sue, is too well known to even require quotation marks. Luckily the overdose of "apple" is more painful in its effects than it is dangerous in its results, and the "balance of diet" in these cases is usually restored by the full exhibition of camphorated tincture of opium, or the free use of that domestic household treasure, Jamaica ginger. But an ounce of prevention is worth a pound of cure, and we trust that the "Pomologist's" specimens will not be "the goodly apples rotten at the core," that are usually found in country groceries, which have so many bruised sides that even the trade procuring card of "take one" fails to empty the barrel.

With regard to the influence of an apple diet on morality, we confess that we do not grasp its connection. The Reverend Lycurgus Morris, however, has discovered it, and in an address to his dusky flock has urged them to accept it, and abide with it forever. For he states "it calms the passions of men and increases the chastity and self-restraint of women, as may be shown by many instances in history, both sacred and profane." As to what particular events the Ohio parson refers, we cannot say, but he can hardly claim that Eve's period of greatest sanctity was ushered in with the eating of the fruit in the Garden of Eden, or that Helen of Troy was more circumspect in her treatment of the appreciative Paris after receiving the apple from his hands.

The colored clergy have, however, always been strong on early Biblical lore, so we hope that Brother Morris's particular orchard will be spared, like that of Uncle Remus, from the raids of ruthless marauders, either human or satanic.

"The devil thought he'd bother me  
By cutting down my apple tree.  
He didn't bother me at all,  
For I had apples all the fall."

#### ULTRAMICROSCOPY.

It has long been known that by intense illumination slits in silver mirrors can be rendered visible which measure only one ten thousandth part of a millimeter in diameter. To make this possible it is essential that light rays of great intensity shall fall upon the object under examination in such manner that only the reflected rays, not those of the source of light, shall reach the eye of the observer. This principle has been utilized in the so-called ultramicroscopic examination of objects, and it has been ascertained that while with our finest microscope lenses, under ordinary conditions, the degree of linear magnification does not materially exceed the one thousandth part of a millimeter, the ultramicroscope renders possible the recognition of objects measuring but a millionth part of a millimeter in diameter. In this manner magnitudes become subject to direct inspection which lie on the border line, where the science of physics and chemistry meet in their respective conceptions of the constitution of matter. The essential point, as has just been stated, is the degree of illumination, while the actual "power" of the objectives is not increased; in other words, the size of the image is the same, but the susceptibility of the retina is increased. We see this principle exemplified in our recognition of the finest particles of dust in the atmosphere of a room when sunlight enters, and when the optical axis of the eye is at right angles to the rays of light. Under ordinary conditions the same particles of dust would remain invisible.

Ultramicroscopical examination opens up an entirely new field of research, and it is to be anticipated that medical science also will be benefited as a consequence. Bacteriological investigations especially will receive a new impetus, as the method is especially adapted to the examination of separate particles, while for the study of connected cells it is scarcely applicable.

Raehlmann has pointed out that many microorganisms can be rendered visible much more readily by the aid of the ultramicroscope than is possible by staining, examination in the hanging drop, etc., and that a great many forms become visible in this manner only. In putrefying albuminous solutions several varieties of ultramicroscopic microorganisms have been met with, which were actively motile, and in several distinct and typical alterations in form have been observed. Studies in this particular direction appear of signal value in the identification of different types.

In the secretion of trachoma Raehlmann found two ultramicroscopic types, and a markedly polymorphous organism, in which three distinct types of form could be distinguished. In the conjunctival secretion in the various affections of the eye unknown bacteria were similarly discovered.

Very interesting are Raehlmann's studies in connection with solutions of glycogen. Such solutions have a slightly opalescent bluish color and upon examination even with the most powerful immersion lenses they appear perfectly homogeneous. On ultramicroscopical examination, however, tiny little particles are seen, which in a solution of one in several thousand are so numerous that they cannot be individually recognized. On further dilution they become apparent, and it is then noted that they execute oscillatory movements which continue indefinitely. Very curiously these movements are dependent to a great extent upon the distance between the individual particles, diminishing in intensity with the degree of dilution, so that finally a point is reached where they cease altogether. Raehlmann accordingly does not regard these movements as identical with the common Brownian movements, but as the visible, motor expression of influences of gravitation, by which the particles attract and repel each other. The individual particles are apparently molecular complexes of typical structure, and may be viewed as molecules of a second order, which in their aggregate properties and relation to the surrounding water represent the typical form in which glycogen exists in solution. This supposition is borne out by the fact that on adding a few drops of a solution of a diastase to the glycogen solution it is possible to observe that as inversion goes on the particles become smaller and smaller and finally disappear altogether.

Quite analogous results have been obtained in the case of the albumins. Here also the individual particles disappear under the influence of the corresponding digestive ferments.

Noteworthy further are the results which Raehlmann obtained in a study of the aqueous humor of the eye. On ultramicroscopical examination it was found that the fluid in question contains the smallest amount of albumin of all the physiological fluids of the body. The lens, on the other hand, is very rich in albumins, which are manifestly contained in the fibers. They dissolve out when the lens is placed in water, and can be microscopically demonstrated. Under normal conditions these albuminous complexes lie firmly packed together surrounded by the elastic

capsule of the lens, so that an elastic and uniformly refractive medium results. Opacities of the lens, according to Raehlmann, result not as a consequence of coagulation of the lens fibers, as has hitherto been supposed, but from optical inequalities of refraction, which are the outcome of a dissociation of the albuminous particles and the interposition of fluid. This conception of the process seems to furnish a new and satisfactory explanation of cataract formation. Quite in accord with this view is the result of the following experiment: On wounding the lens capsule with a fine Graefe lance, through the anterior chamber, the aqueous humor on ultramicroscopical examination is found filled with albuminous particles. This proves that as a result of the injury the aqueous humor does not penetrate the lens, as has been supposed, but exactly the opposite occurs, and it is assumed that these particles produce stasis in the efferent lymph vessels, and may thus be responsible for many of the concomitant symptoms of traumatic cataract, the occurrence of which has hitherto not been satisfactorily explained.

The above results are some of the few which have already been obtained with the ultramicroscope and serve to exemplify the importance of the subject.

## ECHOES AND NEWS.

### NEW YORK.

**Chicago Meeting of Bellevue Alumni.**—New York University sent as its representatives to the annual meeting of the Alumni of the University and Bellevue Hospital Medical College, held at Chicago, the present week, Dr. Joseph D. Bryant, head of the department of surgery; and Dr. Egbert LeFevre, professor of clinical medicine and corresponding secretary of the medical faculty.

**Dr. Peterson and the Hospital Movement.**—A recent issue of *Charities* has the following appreciative comment: "The resignation of Dr. Frederick Peterson as president and member of the New York State Commission in Lunacy has been announced. It is greatly to be regretted that the State should lose the services of so eminent an alienist. Dr. Peterson's interest in the insane has been very largely scientific, and he has given a large share of his attention to the development and improvement of the hospital side of the State care system. The Pathological Institute in New York City, which is under the direction of the commission and which was established to pursue independent research in the field of psychiatry, and to develop, organize and correlate the scientific work of the various State hospitals, has been reorganized and strengthened, and under its capable director has been brought into relations of close cooperation with the State hospitals. Both by the courses of lectures given by the director to the State hospital physicians who have met in New York for the purpose, and by the personal visits



made by the director to the State hospitals, the medical men in the service have been much stimulated, and the scientific aspects of the care and cure of the patients have shown the beneficial effect of this influence. Dr. Peterson has also made an effort to encourage promising young men from the medical schools to enter the State hospital service as clinical assistants without salary, as is done in the case of the large general hospitals in the cities. If these young men leave the service later for private practice they take with them a very valuable experience in psychiatry, one of the most important and most neglected branches of medical science. Among the improvements which are due to Dr. Peterson's initiative is the appointment by the commission of a medical inspector, who supervises both the fourteen State hospitals and the twenty-three licensed private asylums, which were not previously, in all cases, under proper medical inspection. Another reform is the statutory provision that in emergency cases, when the condition of an alleged insane person is such that he should have immediate care and treatment, he may be received at a State hospital for five days pending the routine of procuring needed commitment papers. Dr. Peterson has advocated the most enlightened and scientific care of supposedly recoverable cases of mental disease, and has for many years sought for the establishment of separate psychopathic hospitals in the large cities for the preventive and curative treatment of insanity. Last year the bill introduced in the New York legislature to establish such a hospital in New York City failed to receive the favorable consideration it deserved, though the plan had been advocated by the Governor, and was supported by the State Commission in Lunacy, the State Charities Aid Association, and, to a large extent, by the press and the public. The similar bill already introduced this year has become law.

**Hospital Appointments.**—During the past week the following students at the College of Physicians and Surgeons received appointments: Hudson Street, 1st, T. H. Cherry, G. D. Hale, E. T. Hull; Alternates, R. W. Carter, C. C. Kimball. French, 1st, H. A. Craig, C. W. Walser; Alternates, G. H. Schenck, G. H. Meyer, W. Blancard. General Memorial, 1st, L. L. Miner; Alternate, H. L. Hooper. Jamaica (L. I.) Hospital, J. C. Gain. St. Michaels (Newark, N. J.), 1st, G. H. Meyer, F. H. David, M.D., P. & S., 1903. Bellevue (First Division), 1st, I. O. Woodruff, H. L. Hooper, R. W. Carter, J. D. Peters, C. G. Bandler; Alternates, J. M. Long, C. D. Cleghorn. Gouverneur, P. J. Hamill, J. D. Hastie; Alternate, E. O. J. Eyttinge. Harlem Hospital, G. H. Hibler.

#### PHILADELPHIA.

**Phipps Institute.**—Dr. Randle C. Rosenberger has been appointed pathologist to the Phipps Institute for the Study, Prevention and Cure of Tuberculosis.

**St. Luke's Hospital.**—St. Luke's Homeopathic Hospital patients are soon to be moved from the present Broad Street building to a large house at Broad and Wingohocking streets. It is the intention to acquire the adjoining property and erect a building that will be materially larger than the one at present occupied.

**Municipal Hospital.**—Plans of the new Municipal Hospital now under construction show elaborate arrangements for the perfect isolation of the patients from the outside world and of those suffering from different diseases from each other. The plans include six detached buildings about 50 feet apart and

connected by an 8-foot corridor semi-circular in shape, built on a radius of 400 feet. Three of these buildings will be located on either side of a central one which contains clinic rooms, laboratory, etc. On the opposite side of the corridor will be a nurses' home, a receiving room and the kitchen. Each of the units for smallpox, scarlet fever and diphtheria will have its own physicians, nurses, orderlies and ambulances. Each physician, nurse or attendant leaving the institution must each time pass through three rooms; a disrobing room, one in which anti-septic baths are taken, and a room for donning sterilized clothing. The smallpox unit is now completed.

**Use of Opium Increasing.**—Recent raids on opium joints in this city have led to investigations which are said to show alarming facts. It is stated that opium joints are conducted under the knowledge of the police and that the smoking of the drug has doubled within the past three years.

**Sterilization of City Water Supply.**—The Trades League Subcommittee on Municipal Affairs have recently urged Director Martin to sterilize chemically the water supply of the city in order to prevent typhoid fever. They recommend the use of electrozone, a disinfectant now employed on the city streets; it is made by passing an electric current through salt water. It is understood that they received no encouragement toward chemical disinfection of any kind. Officials do not speak favorably of the methods of chemical sterilization of drinking water, as recently set forth unofficially by government experts. Typhoid fever cases for the past week were 359, a slight reduction from the figures of the preceding seven days.

**Tumors of the Carotid Body.**—The report of a careful study of the embryology and histology of the carotid body and also of a tumor of that structure was made at the meeting of the Philadelphia Pathological Society April 14, by Dr. John Funke. The body in question was probably first mentioned by Haller in 1743. It is situated at or near the bifurcation of the common carotid artery, in size approaching that of a grain of rice. The views of different writers regarding the histology of the body are very various. Dr. Funke does not find the body present so often as is commonly stated; he found it in only one of eight fetuses. In three cats, one guinea-pig and one rabbit no such structure could be found. In one fetus a cervical ganglion occupied the usual position of the body, this fact being determined only after a careful microscopical examination. In the fetus possessing the body it was found attached to the common carotid 6 mm. below its bifurcation on one side; on the opposite side it was on the inner aspect of the external carotid five-tenths centimeter above the bifurcation. The bodies were 7 mm. in diameter and attached to the sheath of the vessel by a delicate pedicle. Histological study indicates that there is a relation between the cells making up the carotid body and the vessel itself; the writer is of the opinion that the lobules of the gland are produced by the proliferation of the endothelial cells of the blood vessel. Dr. Funke finds in the literature the reports of 13 undoubted cases of tumor of the carotid and one that is probable but not proved; to these he adds one hitherto unreported case. This patient was a male, aged forty-eight years, operated on at the Jefferson Hospital by Dr. W. Joseph Hearn. The tumor was on the right side, of six years' duration and of slow, continuous growth. To remove the tumor it was necessary to remove portions of the common, ex-

ternal and internal carotid arteries and of the jugular vein. The patient afterward developed headache, became irrational and finally died of general debility nine weeks after the operation. The tumor proved to be a perithelioma. The tumors of the carotid are usually to be regarded as malignant in nature; Reclus alone questions the propriety of operative interference.

#### CHICAGO.

**Music for the Insane.**—Music produced by a variety of automatic instruments and including airs, ranging from classic opera selections to the latest ragtime melodies, are to be tried as a curative influence on the inmates of the hospital for the insane at Dunning. Four talking and music machines, a music box and an automatic piano player have been received at the institution. The general superintendent, Dr. V. H. Podstata, believes the music will act even more beneficially on the minds of the patients. The musical instruments, which, with a supply of games, and the moving picture machine, were purchased out of a fund of \$1,100 secured by donations, are later to be distributed to the various wards of the hospital and kept in use at all times. It is thought that these entertainments will act as a diversion, taking the patients' minds off their broodings and melancholy thoughts.

**Land for Hospital.**—Land has been bought for Chicago's great hospital for the treatment of infectious diseases, founded by Harold McCormick and his wife, who is a daughter of John D. Rockefeller. John A. Markley has sold to Mr. McCormick the one-fourth block of land at the southwest corner of South Park avenue and Fifty-third street, for \$40,000, and a deal is under way for the purchase of the remainder of the block. Although no definite announcement has been made, it is believed the hospital buildings will cost \$500,000, while aside from this there will be a heavy endowment. Dr. Ludwig Hektoen will doubtless be the medical director of the institution, which will be in affiliation with the University of Chicago.

**The Prevention of Tuberculosis.**—Dr. Arnold C. Klebs recently addressed the Hull House Woman's Club, and among other things, "sleep with your bedroom window open," was a bit of advice given by him. Continuing in his plea for fresh air, he said that the germ of tuberculosis can grow only inside an animal. Outside it can maintain existence a year but cannot grow. Warm conditions indoors are a paradise to the germ. If exposed to the sun and wind, it dies. He pronounced as a fallacy the generally accepted idea that tuberculosis is inherited, and that it may be best treated in the dry air of high altitudes. Tuberculosis can be cured just as well in Chicago as in Colorado or Arizona. Climate has no material effect upon it. High altitudes may do individual cases good. A change of scenery sometimes is advantageous. The disease is not inherited. There have not been more than twelve well authenticated cases of the inheritance of the disease in medical history. Children may be born of parents both of whom are consumptives, and not be infected. Wholesome food comes next to fresh air as a preventive. Cleanliness is another great factor. Great danger of tuberculosis infection lies in milk. Every home should Pasteurize its milk.

**Fight for Pure Milk.**—The expiration of milk dealers' licenses with the necessity for applying for renewals next month furnishes an opportune occasion for searching out unsanitary dairies, and for enforcing rigid compliance with the requirements of

the ordinance governing the sale of milk in Chicago. The Superintendent of Milk Inspection is making preparation to take full advantage of this opportunity. In former years it has been the practice to issue licenses first and inspect afterward. A new policy is to be inaugurated. Everyone of the 3,500 dairies which furnish milk to Chicago will come under the searching eye of an inspector before the end of this month. Dealers who do not come up to the sanitary requirements of the city milk ordinances will be denied licenses. This rule is to embrace all places where milk is kept for sale or for purposes of sale to agents, whether they are actual dairies or not. To make the preventive campaign more effective, the inspectors will insist on the sterilizing of all milk bottles. This, with rigid inspection of the sources of supply and the good work of the Pasteurizing plants, should insure a high grade of milk for consumers during the coming summer.

**Presidency of University of Illinois.**—Dr. William A. Evans, head of the department of pathology of the College of Physicians and Surgeons, has been brought forward by a large number of the leading business and professional men of Chicago as a candidate for the Presidency of the University of Illinois. For several years he has been head of the pathological department of the University of Illinois, and is admirably equipped for performing the functions of this high office. He is in the forefront of every progressive movement, not only in the field of technical research, but in great public matters that tend to better conditions of life in every direction. Dr. Evans is backed by such men as Drs. Frank Billings, John B. Murphy, Fenton B. Turck, Victor C. Vaughan, etc., as well as by distinguished lawyers, business men, etc.

**Unity of Action Sought.**—Closer affiliation between the Chicago Medical Society and the dental, homeopathic and eclectic professions is the object of a Committee on Public Relations, which the Chicago Medical Society established last Wednesday evening, April 13. In urging the adoption of these amendments to the constitution which will establish this new committee, Dr. Evans stated that the dental profession had already been approached on the question of closer relations among the various branches of the healing art, and the proposition met with favor. It was essential to secure unity of action on all questions of public policy. The amendments were adopted by unanimous vote.

**Mortality from Nervous Diseases.**—According to the weekly bulletin of the Health Department, comparing this decade with the previous one, there is shown a decrease of 40.2 per cent. in the mortality from all forms of nervous disease, and of nearly 60 per cent. in the deaths from convulsions. Better hygiene of child life, better milk supply, better knowledge among mothers, account for this latter reduction. The Health Department remarks that it is not so obvious what has caused the reduction of more than one-fourth in the deaths of adults from nervous diseases.

**Exudates and Transudates.**—Dr. Joseph L. Miller read a paper on this subject at the last meeting of the Chicago Pathological Society. He said that points of difference reported between exudates and transudates are size of erythrocyte present, reaction of fluid, presence of nucleo-albumin, specific gravity and amount of albumin, and character of cells present. Size of the erythrocyte no value, as percentage of salts is the same in exudates as in transudates. Both fluids acid to phenylphthalein, exudates having



a higher degree of acidity, but not of sufficient constancy or degree to be of diagnostic value. Nucleo-albumin present in exudates; not present in transudates, but not constant, as in some pleural exudates of the writer's no nucleo-albumin was present. Variations in specific gravity chiefly due to varying amounts of albumin present, as salts show little fluctuation. Specific gravity and albumin depend upon the intensity of irritation, amount of albumin in the blood, tension of the fluid, amount of resorption, blood pressure, and possibly the presence or absence of icterus. An exudate may have a low specific gravity, due to associated anemia or cachexia, or to presence of associated transudate from local venous stasis, or associated icterus. Transudates may have high specific gravity due to associated inflammation, high tension of the fluid, presence of resorption, the salts and water disappearing more rapidly than the albumin. For these reasons, specific gravity is not a reliable index of the nature of the process. The only accurate method of determining the amount of albumin is by estimation of total nitrogen, or weighing dried albumin; bulk methods, as Esbach's or Purdy's, are extremely unreliable; much more accurate is the formula of Reuss. Percentage albumin  $= \frac{3}{4}$  (sp. gr., 1,000) — .8. This is possible, on account of only slight fluctuation in the solids, except the albumin. Cytodagnosis of very limited value.

**Syphilis as a Cause of the Neuroses.**—At a joint meeting of the Chicago Medical Society and Chicago Neurological Society, held April 13, Dr. L. Harrison Mettler read a paper on this subject. He said that the association of syphilis and functional nervous troubles had long been noted. The relationship of cause and effect between them was not so well established. On the one hand, we are not in possession of accurate knowledge as to just how the syphilitic virus affects the neurones so as to cause them to functionate abnormally; nor, on the other hand, do we know just exactly what is meant by a neurosis, its histopathology and pathogenesis. If we could solve positively these two questions the relationship of syphilis to the neuroses would be obvious. In regard to the action of the syphilis upon the neurones, the author argued that it was both direct and indirect. In the direct way it somehow disturbed the normal physiochemical activity of the neurone by a direct poisoning of its molecular contents. In the indirect way it affected the nutrition of the neurone by changing the nutritive value of the blood or limiting the blood supply by setting up disease, with all its well-known consequences, in the vascular walls. Pathologists and syphilographers were fairly well agreed that syphilis can and does thus directly affect the cellular contents, so as to disturb the functions of these cells. Moreover, the relationship of syphilis to the so-called parasymphilitic diseases, as well as its rôle in the latent form of predisposing cause to many of the organic diseases, both indicate that it can influence deleteriously the intimate structure of the nerve cells. This clears the way for the acceptance of the belief that syphilis can provoke a neurosis. All irritative and pressure symptoms caused by the inflammatory products of organic syphilitic lesions, though functional in character, the author regards as physiological rather than pathological, and omits from consideration. He adopts the view that the basis of a true neurosis is a constituent change of some sort in the nerve cells; for, as he affirms, a disturbance of function sufficient to be recognized as a disease, with the preservation of normal structure, is a logical contradiction. A neuro-

sis, therefore, is essentially an organic disease, and is as likely to be the result of a syphilitic as of any other form of infection. In saying this, however, the author was mindful of the fact that nearly all of the earliest manifestations of the syphilitic organic diseases were functional in character for a time, hence care must be exercised in making the diagnosis, for a syphilitic neurasthenia sooner or later shows signs of a meningitis, a functional paralysis becomes an organic paralysis, or a syphilitic chorea reveals signs of Bechterew's cerebrospinal focal sclerosis. After discussing in detail syphilis in its causal relationship to neurasthenia, hysteria, the traumatic neuroses, epilepsy, migraine, chorea, functional paralyses, paralysis agitans, neuralgia, central torticollis, spasms from local ischemia, paralyses of single nerves, and various other functional and convulsive disorders, the author draws the following practical conclusions: (1) Syphilitic infection can produce a pure neurosis. Most of the neuroses so produced, however, are but the preliminary indications of gross organic syphilitic disease of the nervous system; (2) Syphilitic neuroses are as much syphilis of the central nervous system as are the organic syphilitic diseases, and they call for the same thorough antisymphilitic treatment as the latter do.

#### GENERAL

**Detroit Doctors at Stearns' Laboratories.**—Last week the wooden anniversary of the Frederick Stearns' Biological Laboratories was held and several hundred Detroit physicians were the guests at the celebration. Open house was kept all day and there was an almost uninterrupted stream of visitors in response to the unique wooden invitations sent out a week before. All classes were represented, from gray-haired surgeons and specialists of more than national fame to young prospective graduates of 1904, including, of course, a fair proportion of ladies. The regular work of the department was carried on as usual, affording the visitors an opportunity to see in actual operation all the processes used in the production of diphtheria antitoxin, streptolytic serum and glycerinated vaccine. Perhaps nothing caught their fancy more than the modern operating rooms, rivaling those of first-class hospitals, for most physicians are great sticklers for asepsis, knowing its importance. They admired the extensive brick stables, where every provision is made for the care and comfort of 120 horses yielding life-saving serums. From this also was gained an idea of the development of the business, which five years ago was started with but three horses. There were many expressions of gratification at the abundant evidences of the care with which every step is safeguarded in the manufacture of serums and vaccine. A buffet luncheon was served in the travelers' annex, and wooden souvenirs were distributed.

**Suicide.**—"In an instructive article contributed to the *Independent*, Mr. George P. Upton," according to the *Times*, "perhaps the best unofficial authority in this country on the subject treated, shows that within the past thirteen years 77,617 people have committed suicide in this country. In 1902 fifty cities furnished 2,500 cases of self-destruction, out of a total of 8,132 for the entire country. Of the 77,617 suicides in the thirteen-year period, 57,317 were males and 20,400 females. The greatest ratio of increase is among young women under twenty-five years of age. Another curious fact is the increasing number of children who kill themselves. Of the methods chosen for ending life it is curious that a very large proportion select carbolic acid. It is cheap and easily accessible, no doubt, but it must cause an extremely painful death, giving the victim a brief period

of intense suffering while the vital organs are being destroyed by corrosion. The suggestion that the sale of carbolic acid should be placed under the same restraint as other deadly poisons does not seem to promise much. So many other and, for that matter, easier modes of self-destruction are available that to cut off one would probably not affect the net result appreciably. Prior to 1894 more suicides died from bullets than from all other agencies combined. Since then poison seems to have been preferred, with carbolic acid a favorite. The remainder is divided between hanging, drowning, the knife, jumping from windows or roofs, gas, fire and dynamite, while as many as 800 selected the expedient of throwing themselves in front of locomotives. These are gruesome statistics. The lesson to be learned from them depends largely upon the point of view. For some its moral, for others its ethical, aspects predominate. For all it must mean that an increasing percentage of people of a least average sanity find life a bore, and, for one or another of an almost infinite variety of morbid and sophistical reasons, choose to end it. The more complex our civilization and the greater the opportunity for failure and disappointment, the stronger the tendency to self-destruction."

**Vivisection: Two Views.**—Any one who has followed up the arguments of the anti-vivisectionists during the past few years is prepared for any sort of surprise in the way of syllogisms and sophistries; and so commonly have well-meaning but misinformed members of the clergy engaged in this crusade that upon seeing an article by the Rev. Mr. So-and-So upon the subject immediately begins to draw more or less accurate deductions. A recent number of the *Outlook* contains two articles under the above caption,—one by the Rev. Wm. Lawrence, Bishop of Massachusetts; the other by Albert Leffingwell, M.D., Director of the Vivisection Reform Society. Upon giving each of these a careful reading one met with two surprises: the broad, sensible, and exceedingly tolerant view of the Bishop; and the less broad and somewhat restrictive view of the physician. The Bishop thinks that much of the agitation against vivisection is extreme because no one, even the most bigoted, hesitates to allow animals to suffer pain in procuring his daily ration of fowl, pork or beef. He says, "For the life and welfare of men animals must be sacrificed; we all accept this fact when we sit down to our Sunday roast beef." But in thinking that everybody is agreed that some vivisection is necessary he evidently is too liberal in his interpretation of facts. There are some people who even claim that they would rather be tortured themselves than see a dog have a canula thrust into his veins under the influence of an anesthetic; but of course the test is not applicable and hence the argument becomes a fairly good one on the ground of its extreme negative character. In Bishop Lawrence's experience operations on the lower animals have been skilfully and carefully done and with the least possible pain and he sees no need for the appointments of laboratory inspectors, so commonly advocated by the humanizers; for there are no secret operations and any sensible person can see what is being done for himself by tapping at the experimenter's door. Dr. Leffingwell does not condemn the practice as a whole but believes in legal regulation. His confidence in mankind is certainly not remarkable, for he thinks that "We cannot depend to-day upon our superior humanity" to make vivisection as painless as possible, and one can scarcely believe that "Some of the worst vivisections recorded in history have been made in an American laboratory within the past ten years." The reporter would be glad to know, as a matter of curiosity, where that laboratory is located; for it must surely be unique in being the chief offender, and again, not to quibble about the use

of words, it would be interesting to know where to look for a history of vivisection in which his facts are recorded. But when one reads that "Brown-Séquard was one of the most cruel vivisectionists that ever lived" he is inclined to cast a shadow of doubt on every statement in the entire essay. He opposes the good Bishop also, both in theory and actual fact, when he speaks of the "Veil of secrecy behind which vivisection is conducted." Such cases must be extremely few and the writer has never known a single instance where he might not have had an opportunity to visit the laboratory and study the methods employed there in detail. To restrict the practice according to the reformer's idea "Free admission should be accorded all clergymen, physicians and State legislators." Each laboratory should have a responsible director, and all experimenters should be obliged to obtain a State license. The results from each institution should be embodied in a report, as to the number and kind of animals operated upon, the object of each experiment and its result to the animal. It is needless to say that this method if adopted would be cumbersome, very expensive, and quite unnecessary. In some cases it might be advisable to warn new and inexperienced operators against thoughtlessly giving pain, but an experimental laboratory is usually under the supervision of a competent investigator, who, even in his great desire for the advancement of science, would scarcely stand by and hear the outcries of an animal in pain. This might have been the case before the era of anesthetics but it is not true now. To the minds of liberal people everywhere the remedy of Bishop Lawrence against this so-called "evil" is sufficient; viz., "The great safeguard against cruelty in vivisection is the high professional spirit of doctors and investigators."

**The Beverage Bill for 1903.**—"Prosperity seems to lead to an increased use of stimulants," says an article in a recent issue of the *American Grocer*, and, summing up the nation's drink bill for the year ending June 30, 1903, the total retail cost of alcoholic and other stimulating beverages is estimated at \$1,451,633,379. This is a considerable advance over the average annual cost for five years before, \$1,293,903,358. On the basis of 80,372,000 inhabitants in the United States, the record shows an expenditure for stimulants of \$18.15 for each person. The consumption has largely increased in the milder sorts, such as coffee and beer, with coffee in the lead, and while alcoholic drinks to the value of \$1,242,943,118 have been taken, the non-alcoholic stimulants—coffee, tea and cocoa—amount to \$200,000,000 more. Coffee is in the lead, \$156,690,261 being the amount spent for it. For tea \$45,000,000 was spent, and for cocoa \$7,000,000. Coffee outstripped all the others, according to the following table:

	Gallons.
Coffee .....	1,566,902,614
Beer .....	1,449,879,952
Tea .....	450,000,000
Spirits and wines .....	157,130,628

One-tenth of a gallon per capita increase in the use of spirits is the largest recorded from one year to another since 1900; 148,206,875 gallons were distilled, and the consumption, including fruit and imported spirits, was 117,252,148 gallons. Of this the whisky bill is the greatest. Beer, the popular beverage next to coffee, had in 1903 the highest consumption on record; 18.04 gallons are put down to each person, a gain over 1902 of 0.55 gallons. Eliminating those who do not drink beer, it is estimated that the average person who lingers over the stein consumes from 90 to 100 gallons in a twelve-month.

Prosperity may be the cause for the opening of more bottles of imported wines than ever and a serious falling off in the consumption from the home vineyards. The



table for the two years past is interesting by comparison and is as follows:

	Domestic. Gallons.	Imported. Gallons.
1902 .....	44,737,244	5,017,159
1903 .....	32,631,154	6,088,201

Leading all other nations of the world, the United States consumes nearly one million pounds of raw coffee every year. The average for the last three years has been 910,987,576 pounds.

With the exception of 1897 the imports of tea were last year the largest on record. Conservative estimates on the brewing of the 104,632,260 pounds imported place the decoction as 450,000,000 gallons, worth \$45,000,000.

#### OBITUARY.

Sir HENRY THOMPSON, Bart., the distinguished surgeon, died April 18. He was born in August, 1820. He is succeeded in the baronetcy by his son, Henry Francis Herbert Thompson. Sir Henry Thompson was created a baronet in 1899. He was surgeon extraordinary to the King of the Belgians, consulting surgeon to the University College Hospital, London, and Emeritus Professor of Clinical Surgeons. He was born in Framlingham, Suffolk, August 6, 1820. He was graduated in medicine at the University College, London, where he won honors. He was the author of numerous papers on scientific and surgical subjects which are generally accepted as authoritative, and also wrote two novels, "Charley Kingston's Aunt" and "All But." He was known also as a painter of ability and a deep student of astronomy.

Dr. WILBUR F. NUTTEN, one of the best-known medical practitioners of Western New York, is dead at his home in Newark, N. Y., aged sixty-four years. Death resulted from heart failure. Dr. Nutten was a graduate of the Medical College of Physicians and Surgeons of New York City.

#### CORRESPONDENCE.

##### MEDICAL LEGISLATION IN NEW YORK.

To the Editor of THE MEDICAL NEWS.

DEAR SIR: The legislature has adjourned, and both the Optometry Bill and the Osteopathy Bill have failed to become laws. There never was an effort made to secure legal recognition by any of these peculiar practitioners which had in it anything like the force of the Opticians' Bill of this year. In the beginning of the session the reports which I received from various quarters seemed to indicate that the measure would become a law. But thanks to the support given the Committee on Legislation by the medical profession in all parts of the State, what seemed to be defeat for us has been turned into victory. I have no doubt that the medical profession can, through its representatives, control legislation affecting the medical laws, and the public health generally. In my experience I have found the various members of the legislature not only willing but anxious to learn the views of our profession, and the majority of them are willing to be guided by our advice.

I want to thank you for the very great aid you gave our Committee, and to express the hope that sometime in the future when the necessity again arises, we may feel at liberty to call on you for the same kind of aid. Again thanking you, I am,

Very truly yours,

FRANK VAN FLEET,

Chairman of the Committee on Legislation, of the Medical Society of the State of New York.

#### SOCIETY PROCEEDINGS.

##### THE AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS.

Fourth Annual Meeting, held in New York City, April 1 and 2, 1904.

(Continued from Page 766.)

**Case of Glioma of the Sella Turcica.**—Drs. E. E. Southard and Frederick H. Howard presented this case with photographs of the macroscopic and microscopic appearances of this tumor which Dr. Southard said had probably developed in the posterior lobe of the pituitary body.

**Micrococcus Flagellatus.**—This was the name given by Dr. O. Klotz, in a paper read by Dr. Adami, to a hitherto undescribed organism found in the spleen and liver, but not in the blood of rabbits during an epizootic among rats and rabbits, which he had observed.

**Blank Cartridges and Tetanus.**—Dr. David H. Dolly, after making careful examinations of large numbers of cartridges made by several different manufacturers, stated that he had found a tetanus like bacillus, but in his efforts to cultivate the tetanus bacillus from the cartridge he had failed, but that he had produced typical tetanus in rats by inoculation, and this he thought was sufficient evidence that the wads from which he made the inoculation contained the tetanus bacillus. He also obtained by cultivation the *Bacillus pyogenes capsulatus*. The powder, he said, was sterile.

**Staphylococci in Systemic Infections.**—From a study of almost four hundred and fifty cases of sepsis observed during a period of six years, Dr. Emanuel Libman, of New York, had come to the conclusion that the *Staphylococcus aureus* played a very important rôle in systemic infections, almost as important as that of streptococci. The *Staphylococcus albus* played, he thought, a very small rôle, seeming to be in the main an original invader. The staphylococcus cultures he had found only once in the blood, in a case of osteomyelitis, but he considered the finding important because it proved that the organism could cause a systemic infection. He had seen no case in which the finding of the *Staphylococcus albus* in the blood had been followed by a metastatic deposit in which the organism could be found. In the severe cases of infection by the staphylococcus aureus the organism was usually found in the urine. In several cases, multiple abscesses of the skin were found. These were most profuse in the scalp. Of the 26 cases in which the *Staphylococcus aureus* was found in the blood seven recovered.

**Differentiation of Flagellar and Somatic Agglutinins in Motile Bacilli.**—Dr. Henry G. Beyer, of Boston, presented the work done by Dr. A. L. Reagh and himself. The existence of flagellar and somatic agglutinins was confirmed not only through the employment of motile and non-motile cultures obtained from hog-cholera bacilli and the sera produced by them, but also through exposure of either the cultures or their corresponding sera to definite temperatures and observing the results of agglutination produced by such modified fluids. It was shown that the flagellar and somatic bodies found in the hog cholera bacilli corresponded to the Alpha and Beta bodies found by Ioss in the bacilli of Eberth, notwithstanding the fact that these bodies in the hog-cholera bacilli proved to be much more resistant to temperature than the corresponding bodies in the typhoid bacilli. Immunization experiments made with cultures heated at different temperatures resulted, moreover, in showing that the heat, while

preventing agglutinations from becoming apparent, did not destroy the power of cultures of producing agglutinins in the body of the animal as evidenced by the reactions of the sera produced with them. This interesting fact was explained on the principle of Ehrlich's theory of agglutinins, the heat being assumed to convert the agglutinogenic substances contained in the cultures into agglutinins and thus to prevent visible agglutinations without, however, destroying the substances themselves nor their power of producing agglutinins in the body of an animal exactly the same as unheated cultures will do.

**Hemangioma-sarcoma of the Skin of the Finger.**—A case reported and described by Dr. W. McN. Miller, of Columbia, Mo. In discussing the tumor, Dr. Miller made the following classification of true blood vessel tumors with respect to the development of the endothelium. (1) Proliferation of endothelial cells in a single layer with dilatation of vessel—hemangioma cavernosum. (2) Proliferation of endothelial cells in a single layer, with new growth of capillaries and vessels—hemangioma simplex. (3) Proliferation of endothelial cells centrally with more or less obliteration of lumen—hemangioma-endothelioma intravascular. (4) Proliferation of endothelial cells peripherally—hemangioma-endothelioma hypertrophicum. (5) Proliferation of endothelial cells after the manner of all the above given groups. Hemangioma-endothelioblastoma. He placed the tumor described in the fifth group.

**Adrenal Gland Infusion—Effect upon Animal Serum.**—This investigation was undertaken by Dr. N. Gildersleeve, of Philadelphia, for demonstrating the effects upon guinea-pigs and on guinea-pigs' erythrocytes in vitro of the serum of rabbits treated with infusions of guinea-pigs' adrenals, and of the serum of rabbits treated with small quantities of defibrinated guinea-pigs' blood. The immediate symptoms following an injection of adrenal serum into the peritoneal cavity of the guinea-pigs were marked. The animal became stupid and weak, lay on its side or abdomen, the respiration was hurried, and the heart usually rapid. The temperature quickly fell from 1 to 2° below normal, but in from three to six hours rose to normal and the symptoms usually disappeared, and in the course of a few days the animal, to all appearances, recovered from the effects of the treatment. The immediate effect following the injection of serum from rabbits treated with small quantities of defibrinated guinea-pigs' blood (1/1,000, 1/100, and 1/10 c.c.) were as a rule not as marked as when the adrenal serum was employed, but the guinea-pig became weak and emaciated, usually dying in from one to six days, showing marked changes in the blood and certain other tissues, notably the liver, kidneys and lungs, the effects to a certain extent varying according to the degree of immunization. Normal serum was employed to control the above experiments. The effects of this were as a rule but slight, in many cases the animals showing no effect of the treatment. Experiment showed that the hemolytic action of rabbit serum on guinea-pigs' corpuscles is increased by the treatment of the rabbits with defibrinated guinea-pigs' blood. Dr. Gildersleeve arrived at the following conclusions: (1) That there is something produced in the tissues of rabbits treated with washed guinea-pigs' adrenals which, when injected into guinea-pigs, produces marked symptoms which are usually transient. (2) That the serum of rabbits treated with repeated injections of small quantities of guinea-pigs' erythrocytes has, when injected, a

quite marked destructive action on the blood and certain other tissues of the guinea-pig. This action depends to some extent on the degree of immunization. (3) That the hemolytic action of rabbit serum on guinea-pig erythrocytes in vitro is increased by the immunization of these animals with small quantities of guinea-pig blood.

**Epithelial Tumors of the Skin and Mucous Membranes with Special Consideration of "Carcinoma Basocellulare."**—A preliminary report with lantern demonstration by Dr. Joseph C. Bloodgood. He said that in the routine study of epithelial tumors in the pathological laboratory of Prof. Halsted's Clinic in the Johns Hopkins Hospital, since June 1892, he has found from time to time a microscopic picture in which all the epithelial cells resembled the cell of the deeper layer of the epidermis. These tumors have been described in the pathological records as epithelioma of the deeper layers of the epidermis. In some instances the histological picture resembled an endothelioma, but were never considered as sarcoma. No special nomenclature was, however, adopted. Some six months ago he began a systematic clinical and pathologic study of 468 cases of epithelial tumors of the skin and mucous membrane. Very soon he became impressed that this peculiar variety of epithelioma was not uncommon. Fortunately at this time Krompecher's monograph "Der Basalzellenkrebs" appeared. At once he found that his descriptions and illustrations were identical with this variety of epithelioma, and for this reason he adopted his nomenclature—carcinoma basocellulare. Among 468 cases of epithelial tumors at least 78 (16.5 per cent.) belong to this group. This tumor arises from the skin and is situated most frequently on the nose (50 per cent., 13 out of 26 cases); skin of body (4 out of 8 cases); skin of upper lip (5 out of 10 cases); chin (2 out of 4 cases); eyelid (12 out of 24 cases); scalp (6 out of 17 cases = 40 per cent.); face and cheek (14 out of 55 cases = 33 per cent.); ear (3 out of 9 cases). In the following regions the tumor is rare: lower lip (4 out of 106 cases). In these four cases the tumor arose from the skin and not from the mucous membrane; skin of lower extremity (2 out of 22 cases); upper extremity (2 out of 19 cases); mucous membrane of mouth (2 out of 29 cases); mucous membrane of tongue (5 out of 53 cases); penis (3 out of 29 cases; in these three instances the tumor originated from the mucous membrane of the urethra near the meatus); skin of neck (1 out of 3 cases). The age of onset is usually after fifty years. The tumor grows slowly. In some instances it remains for months or years as a single lesion. It appears first as a small nodule in the skin. The thin epidermis ulcerates and a scab forms. Beneath the minute area of ulceration there is a narrow zone (2 to 4 mm.) of granulation tissue in which the basal cell alveoli are found. In some cases the disease extends and produces multiple lesions of a similar character. In this instance the surrounding skin is usually indurated. Not infrequently the disease in its growth produces a superficial ulceration which sometimes covers very large areas (6 to 14 cm.). Clinically this is the typical rodent ulcer. The fourth clinical variety appears as a fungous tumor. The elevation of the fungus above the surrounding skin may vary from 5 mm. to 3 cm., but the growth beneath the surrounding epidermis is with the rarest exceptions superficial. The small lesion may remain stationary up to fifteen years, the majority of the larger ulcers have been present over five years, many ten and fifteen years. In a very



few cases, in the more extensive lesions, the condition has become inoperable on account of deep infiltration (3 out of 78 cases). Metastasis to the neighboring lymphatics has so far been observed in only two cases. Up to the present time all the cases subjected to complete excision have remained free from recurrence from periods of a few months (recent cases) up to twelve years. Histologically the small lesion is usually composed of solid alveoli of basal cells: *carcinoma basocellulare solidum*, or the basal cell may show a glandular reticulum and arrangement: *carcinoma basocellulare adenoides*. Quite frequently the two are combined. In the extensive rodent ulcer variety one finds in a stroma of granulation tissue large stellate alveoli, and in the infiltrating parts, minute irregular alveoli, similar to the histological picture of scirrhus carcinoma. For this variety Krompecher has no terminology. In the large fungous tumors the basal cell alveoli are large, tubular in shape. Usually the center of the tubule is filled with degenerated epithelium, colloid or hyaline, or there are definite cyst formations: *carcinoma basocellulare cysticum et tubuliferum*. It is important in practical surgery to recognize this less malignant form of carcinoma of the skin and mucous membrane, because it is unnecessary to remove the neighboring lymphatic glands. A close study of the cases under Dr. Bloodgood's observation demonstrates that complete excision gives invariably perfect results. Many of the cases, over 50 per cent., were subjected to caustic applications before their admission to the surgical clinic, and quite frequently the minute lesion present at the time of the first application of the caustic has, after this treatment, begun to spread. One cannot deny that the small superficial lesion may be cured by the proper application of caustics, but he is convinced that it is by no means as certain as complete excision with the knife. The latter, properly performed, should cause even less deformity. Apparently this form of carcinoma of the skin reacts to the X-ray treatment better than any other variety of carcinoma. For this reason, if the lesion is situated on the nose, eyelid or ear, where complete excision would necessitate mutilation, it is justifiable to give the X-ray a fair trial. There is no danger in the delay, and the treatment in a certain number of cases, apparently, so far, has accomplished a cure. However, where complete excision is possible without mutilation, this method undoubtedly is the one of choice. Even in the very extensive rodent ulcers apparent healing has taken place after prolonged X-ray treatment.

**Comparative Morphology of Vaccine Bodies.**—Dr. James Ewing, of New York, made a preliminary report on the comparative morphology of vaccine bodies in which he showed some interesting lantern pictures of cellular and nuclear and nucleolar changes in the tissues at the point of vaccination in the skin in measles and in diphtheria.

**Xanthoma.**—Dr. Guthrie McConnell, presenting a case for Dr. Joseph McFarland, of Philadelphia, said that the patient from whom the specimens were taken suffered from widespread xanthoma of the face, hands, body, feet, and there was also a nodule situated within the mucous membrane of the lip at the base of the lower central incisors. Patient is an American boy of eighteen years, white; is greatly stunted in his growth and has occasional attacks of jaundice. The material examined consisted of two small masses removed from the anterior aspects of both knees. On the surface of the growths were numerous small yellow areas. Most of the changes observed in the epidermis were

atrophic in nature. The rete mucosum was thin and the papillae were in places entirely absent. The chief changes were in the reticular layer and consisted of its invasion by cells that were very characteristic. These cells, designated by many as xanthoma cells, are large and at first glance resemble very closely those of the sebaceous glands. They are sharply defined by thin but distinct walls and are flattened by mutual contact. In the central portions of the large aggregations, where they were presumably oldest, they were largest and contained the greatest number of droplets of what appeared to be fat. As one passed from the central to the peripheral portions of the cell masses it was found that with rare exceptions they possessed no definite limitations, but extended as a continuous reticulum throughout the fibro-elastic framework of the cutis vera. The peripheral extensions consisted of smaller cells of cuboidal shape, with more distinctly vesicular nuclei, with greater affinity for the stain than those of the older central cells, and contained fewer and smaller fat droplets. In those specimens that were stained to show fat the results were not satisfactory. There were in several areas numerous fine granules that to some extent showed color change, but it was not restricted to those portions that corresponded to the xanthoma cells nor was the reaction itself characteristic. The opinion of the majority of observers is that the granules are indeed fatty in nature. Is more certainly fat in xanthasma than in the other forms of xanthoma. The cellular extension did not invade the subcutaneous tissue. One of the most striking features was the total absence of sebaceous glands. No structures that could be definitely made out as such were present. New formed capillary blood vessels were quite numerous. The first theory that suggests itself as to the histogenesis of these cells is that they are derived from pre-existing sebaceous glands. This is, however, disproved by the frequent occurrence of the xanthoma masses in the mucous membranes and in internal organs where there are no sebaceous glands. The second theory, which seems to have no foundation, is that the growths result from changes in the muscle fibers. It is finally held that the cells are of endothelial origin and are derived from the cells normally present in the lymph spaces and channels. The assumption of fat is not known to be a peculiarity of endothelial cells. The source of the fat globules is of great importance. Either they must be formed within the cells or must be conveyed to them. The general appearance would suggest that the fat is formed in the xanthoma cells and by their activity. The magnitude of the cellular characteristics and their reticular distribution make it almost inconceivable that they are cells normal to the parts which have become infiltrated with fat. All appearances justify belief that the cells belong to some genus whose members have a normal fat-forming or fat-storing tendency, and that these cells so endowed multiply and penetrate into the tissues and continue in all directions their normal tendencies. Every evidence is in favor of the connective tissue origin of these cells, but that they are endothelial in character seems to us very doubtful. According to Waldeyer, Virchow and Kaposi, we have a process going on in the xanthoma that is analogous to the formation of normal adipose tissue. They believe that the new cells grow to a considerable size and develop processes so as to form the fusiform and stellate corpuscles of connective tissue. These cells are liable to undergo fatty degeneration, but the process is slow and less destructive, and resembles the normal transformation of ordinary connective into adipose tissue. Török concludes that the xanthoma plaque is composed of adipose cells inter-

rupted in their progress to complete evolution and that it is not a tumor but an excess of growth.

**Trypanosomiasis.**—In a report of experiments with the genus of protozoa, *Trypanosoma*, Dr. P. Ehrlich, of Frankfurt-a.-Main, said that he had produced a compound which possessed decided specific action upon the *Trypanosoma equinum* (the protozoan of mal de caderas). Mice infected with this parasite were rendered temporarily immune by this substance which he has named "Trypanoth." Further experimentation he hoped would discover a compound which would cause a reaction on the part of the organisms of other animals sufficient to kill the parasite. Professor Ehrlich compared the action of the various substances (arsenic and benzopurpurin) which had been found to produce what had proved a temporary immunity to the *Trypanosoma*, to the action of quinine in malarial infection.

**Lymph-nodes in Hemangioma of the Orbit.**—Dr. Aldred Scott Warthin, of Ann Arbor, Mich., presented a large number of lantern slides illustrating this subject and said that in a tumor of the orbit which had grown slowly for twenty-three years and which microscopically presented the structure of a hemangioma cavernosum, there were found numerous typical lymph-nodes with characteristic germinal centers. The nodes were so numerous that eight to twelve could be found in a single section. The development of such nodes and germinal centers could be easily traced. Two modes of formation were seen. In one there was at first a proliferation of the endothelium and perithelium of the blood spaces forming a reticular network extending across the lumen of the blood space. In this reticulum lymphocytes gradually collected, and from the further proliferation of the endothelium at certain points germ centers were formed. Free red blood cells were found in the spaces of the reticulum, and about the follicles a more or less perfect blood sinus was developed. The new nodes therefore presented the structure of hemolymphatic tissue rather than of ordinary lymphatic. In the second mode of formation there was at first a proliferation of the endothelium of a capillary in the connective-tissue trabeculae separating the blood spaces. As a result of this proliferation there was first formed a typical germ center about which the lymph follicle gradually developed, the lymphocytes apparently arising from the germ center. All possible transition stages of both modes of formation could be seen. The formation of the lymphoid tissue appeared to be entirely secondary and not to constitute an integral part of the tumor structure. Stasis probably plays the chief part in its development, and with this factor there is probably associated a more embryonal character of the endothelium of the blood spaces of the tumor.

**The Occurrence of Myeloid Changes in the Hemolymph Nodes.**—(Dr. Warthin.) In a number of cases of leukemia and in one case of fatal anemia following prolonged and repeated small hemorrhages from the nose there were found in the retroperitoneal hemolymph nodes changes that could be interpreted only as of a myeloid character. Neutrophile and eosinophile myelocytes, bone-marrow giant cells as well as a great variety of non-granular mononuclear forms and atypical lymphocytes were present. Given sections of the nodes could not be distinguished from given sections of bone-marrow. In the leucemic cases the process was regarded as of the nature of metastasis, in the hemorrhagic case as a reversion to an embryonal form of blood-formation. While under normal conditions mononuclear eosinophile and cells resembling bone-marrow giant cells are almost always to be found in the hemolymph nodes, there is no reason to believe that these nodes ordinarily play any part in hematopoiesis.

The occurrence of such marked myeloid changes in the nodes as found in the case of fatal anemia is probably to be regarded as of the nature of a compensation for the bone-marrow.

**Eosinophilous Transformation of Lymphocytes; the Formation of Eosinophiles in the Hemolymph Nodes; the Relation of Eosinophiles to Hemolysis.**

—Dr. Warthin said that mononuclear eosinophiles are almost constantly present in small numbers in the hemolymph nodes, and under certain conditions they may be found in these organs in great numbers. In such cases all possible transition forms between lymphocytes with eosinophile granules and the polymorphonuclear eosinophiles are seen. The morphological evidence may be taken as favoring the view that eosinophile polymorphonuclears may be found from lymphocytes. Such findings oppose the generally accepted view of Ehrlich as to the origin of the eosinophile cell. In all cases in which there is hemolysis of the eosinophiles of the hemolymph nodes are increased in number. In some instances nearly all the cells of a node may show eosinophile granules. The relation of the products of the destruction of the red cells to the formation of the eosinophile granules is not a direct one, but it is possible that the granules represent further elaborated products of red cell disintegration.

**Hemolymphotoxin.**—Dr. Warthin read this paper for Mr. Harro Woltman, of Ann Arbor, Mich., in which he said that a comparative study had been made of the effects produced by the injection of the sera of geese made immune to sheep's blood, spleen, bone-marrow, lymph glands and hemolymph nodes. In the sheep injected with such immune sera the changes in the blood as well as in the tissues are identical in kind but differing in degree. All the sera were hemolytic, lymphotoxic, myelotoxic, and endotheliotoxic, the results of the injections varying only in intensity. The sera of geese made immune to injections of emulsions of sheep's hemolymph nodes produced a more intense action than the sera of those made immune to spleen, bone-marrow, etc. The hemolymphotoxic serum caused greater hemolysis than serum immune to sheep's corpuscles. When heated the hemolymphotoxic serum lost the greater part of its hemolytic power, but not all. Injections of such heated serum caused a marked proliferation of the endothelial phagocytes in the sinuses of the hemolymph nodes.

**Action of Antistreptococcus Serum.**—Dr. D. H. Bergey, of Philadelphia, read a paper on studies made by him on the action of antistreptococcus serum.

**The Biochemistry of the Tubercle Bacillus** was discussed by Dr. P. A. Levene, of New York, and he also read a report of work done by Dr. L. B. Stookey and himself on Autolysis.

**NEW YORK NEUROLOGICAL SOCIETY.**

*Stated Meeting, February 2, 1904.*

President *pro tem.*, Joseph Fraenkel, in the Chair.

**Case of Huntington's Chorea.**—This was presented by Dr. J. Ramsay Hunt. The patient was a Hungarian, thirty-three years old, the youngest of seven children. He had been a resident of the United States for six years he had twitching movements of the upper extremities could be elicited. From the patient's sister it was learned that he was extremely dull, even as a child, and lacked interest in his studies. For the past three years he had twitching movements of the upper extremity, confined chiefly to the fingers and wrist of the left arm. Similar muscle-twitching was also present in



the left lower extremity, consisting of slight flexion movements in the ankle and toes. Occasionally, the left quadriceps extensor contracted, elevating the patella. The face was the seat of irregular grimaces and twitches, and the latter were also present in the tongue, interfering at times with speech. These movements were at no time violent, and seemed to be increased by voluntary movements of the parts. The left upper extremity was complained of by the patient as feeling cold and heavy, and interfering with finer movements of the hand, such as eating. Mentally, the patient was dull. He was cranky and irritable at times, careless in his dress, and was unable to obtain any employment. At times, he had mild acute mental symptoms and apparent hallucinations. He had complained of frontal headaches at intervals since the onset of the trouble. Otherwise, the examination proved negative. Muscular power was unimpaired; there was no ataxia; no sensory disturbances. The pupils and all reflexes were normal. He had never had a convulsion.

Dr. Hunt said that the character of the twitches, although slight and limited to the left side, resembled those observed in Huntington's chorea. The constancy of the symptoms, the pronounced and progressive character of the mental changes, even in the absence of heredity, pointed very strongly to a degenerative form of chorea. An initial psychosis with secondary motor manifestations would deserve consideration in the differential diagnosis.

**Case of Multiple Cerebellar Tumors.**—Dr. B. Sachs presented the specimen of a case of multiple cerebellar tumors. These had given rise to the usual symptoms of a cerebellar neoplasm. There was marked ataxia of the left upper extremity, and a tendency to fall to the left. The skull was trephined for the purpose of relieving pressure and preventing the development of complete blindness. The patient died from shock a few hours after the operation.

**Cerebrospinal Lues (Syringomyelia Symptom Complex).**—This was presented by Dr. Isador Abrahamson. The patient was a male; thirty-five years old; single; a pedler, and a native of Rumania. When he was eleven years old, after a fright, he became blind in the right eye and the vision of the left eye became impaired. Some improvement in sight occurred within two months. When he was sixteen years old he contracted a chancre, with the usual secondary symptoms. He was treated for this disease for one year with both external and internal remedies. He was moderately addicted to the use of alcoholic stimulants, and smoked excessively. About six years ago he developed an abscess on the left side of the neck. This was incised and drained. Subsequently, he suffered from pains in the left upper extremity and left side of face; these were shooting in character and were accompanied by paresthesias over the same areas. Later, he suffered from weakness in the left hand, with beginning atrophy, and his voice soon assumed a raucous character. Five years ago he developed a luetic keratitis in the right eye, which cleared up under insufflations of calomel. About this time swelling of the fingers was first noticed. Two years ago he again had difficulty with his eyes, with temporary blindness, and blueness and limitation of vision. He had frequent attacks of diplopia during the past six years. Since last summer he had repeated crops of vesicles on fingers, with beginning wasting and simultaneous weakness of the right hand. At irregular intervals there was interference with urination, now retention, now slight incontinence. Also some difficulty in defecation, with constipation and diminished sexual power. He suffered from headaches on the left side, with some vertigo and tinnitus aurium and loss of hearing on that side.

**Status praesens.**—General enlargement of the lymphatic glands, many stigmata of degeneracy, convergent strabismus due to weakness of both external recti; marked nystagmus, rotary in character, especially in lateral positions; eyes prominent; Von Graefe symptom present; pupils irregular, the right being larger than the left. Both light and consensual reactions were sluggish; the accommodative reaction much prompter. Vertical axes of eyes not parallel. Right lower facial innervation stronger than the left; jaw-jerk present; right pharyngeal stronger than the left; pharyngeal reflex present. Hands blue and congested; fingers thickened, with small, rounded vesicles of various size scattered over them. Thenar wasting, more pronounced on the left side; hypothenar wasting less marked. Reaction of degeneration in some muscles; marked loss of power in hands and forearms; more marked on the left side. Deep reflexes of the upper extremities diminished. Heart, lungs and other viscera apparently normal. Knee-jerks active, especially the left; likewise the Achilles reflex. Tactile sensibility was practically normal. There was disturbance of the pain sense, chiefly analgesia, over the chest and upper extremities, principally on the left side, and thermanesthesia for both hot and cold over the same areas. Deep muscular sensibility was disturbed in all four extremities. Vision, O. S., 6-200; O. D., 20-200; marked staphyloma posticum; detachment of retina in left eye, downward and outward. The changes were very suggestive of a luetic origin. To sum up, the case was probably one of cerebrospinal lues, presenting the syringomyelic symptom complex, or else it was a case of syringomyelia, plus lues, or possibly of luetic origin. Such cases, the speaker thought, were rather uncommon, and were naturally of considerable clinical importance.

Dr. Sachs, in discussing this case, said he had seen some cases which, while luetic, presented the clinical aspect of syringomyelia. He regards these cases as examples of cerebrospinal lues, not luetic syringomyelia.

**Flaccid Luetic Hemiplegia with Atrophies.**—Presented by Dr. Abrahamson. The patient was a male, twenty-six years old; married; a Russian pedler. He was an excessive smoker and used alcoholic stimulants in moderation. He had lues four years ago. Ten years ago he had an attack of parasitic alopecia, and six years ago he sustained a severe fall. This resulted in a Colles' fracture and he was said to have been unconscious for a long time. About two months ago he was obliged to remain in bed for three weeks on account of stiffness of the neck, violent neuralgic occipital pains, and headaches, chiefly nocturnal. During the third week of this illness he began to suffer from severe right-sided headaches, with vertigo. Three weeks ago, while in a café, he felt dizzy and staggered as though drunk. He fell to the floor and found that the right side of his body was numb and paralyzed. Speech was also lost. This condition lasted about five minutes, when he apparently again felt normal. A short time afterward he had a second attack lasting five or six minutes, and in the course of two hours he had four additional similar attacks. From the sixth attack, however, he failed to recover; speech was lost for four days and the paralysis still persisted. At the present time there was paralysis of the lower two-thirds of the right face and of the right upper and lower extremities. There were dropped wrist and foot on the right side; flaccidity of the right hand and forearm; also the leg and foot. Decided wasting in right posterior forearm musculature; also, but to a lesser degree, in the right leg. The electrical reactions in the posterior forearm were much diminished; myotatic irritability diminished; sensibility intact; heart normal.

Dr. Abrahamson said that in view of the electrical

changes, the marked wasting, flaccidity and altered myotatic irritability, all occurring within three weeks after the onset of the attack, he felt justified in calling the case a flaccid hemiplegia with atrophy.

**Jacksonian Epilepsy of Luetic Origin.**—Presented by Dr. Abrahamson. The patient was a male, thirty-nine years old, a shoemaker by occupation and a native of Hungaria. He was married and the father of eight children, of whom six were living. His first wife had three miscarriages occurring about the third or fourth month. The patient had typhoid fever in childhood. He was a heavy smoker and a moderate drinker. He positively denied venereal infection. His present illness dated back to Dec. 15, 1903, when he began to suffer from frequent attacks which were ushered in with a feeling of numbness in the right hand, followed by a drawing in of the thumb, flexion of the fingers and semipronation of the hand. The numb sensation spread to the shoulder, then down to the hip and feet. He complained of weakness of the leg and had to sit down to keep from falling. Speech was also temporarily lost. Each of these attacks, which sometimes occurred at hourly intervals, lasted about fifteen minutes, and were followed by some weakness of the right side and slight dizziness. He also complained of left-sided headaches and slight nausea and epigastric distress at the end of the attack. There was also rolling of the eyes during the attack, and rolling of the tongue upon attempting to speak. No frothing; no biting of the tongue; no diplopia. Micturition and defecation were not affected. There was no loss of consciousness. An examination showed that the right pupil was larger than the left. The pupillary reactions and ocular movements were normal. There was weakness of the entire right half of the body, including the lower two-thirds of the face. There was some exaggeration of the deep reflexes on the right side. The special senses were normal. The eyes showed a beginning papillitis.

The patient was put upon inunctions of mercury and large doses of potassium iodide. At first, the weakness on the right side increased, and a right hemianesthesia of somewhat irregular distribution developed. Subsequently, he improved rapidly, and at the present time he had entirely lost his attacks, the right-sided weakness was much less, and only scattered areas of diminished sensibility were present over the right side.

**Arteriosclerosis of Spinal Cord, with Hemorrhage.**

—This case was presented by Drs. Joseph Collins and Edwin G. Zabriskie. M. H., a fireman, with no particular antecedents, noticed toward the end of 1902 fatigue on exertion, jerking sensations, occasional sharp pains in lower extremities, and a sensation of heaviness, accompanied by difficulty in holding his urine. These symptoms steadily progressed, until he awoke one morning and found himself unable to stand or walk. There was also incontinence of the bowels and bladder. On examination, it was found that he was unable to flex his thighs slowly, and there was slight atrophy of the left anterior and inner thigh muscles. The reflexes were absent; Babinski's phenomenon present. Power in the upper extremities was fair, but he was easily fatigued. There was slight quantitative diminution of sensation in both lower extremities, and a zone of hyperesthesia as wide as the hand above the trochanters. There was slow speech and mental reflex. Also a moderate degree of general arteriosclerosis. Death supervened gradually of cardiac weakness. Autopsy: Macroscopically, there was arteriofibrosis everywhere, only slightly marked in the brain and bulb, but very marked throughout the cord. The vessels were distended with blood, and there was some extravasation into the perivascular spaces. The changes consisted in thickening of the media and propria, with loss of muscular tissue.

A hemorrhage was found in the ninth dorsal segment of the cord, involving the right posterior and left anterior horns. There was sclerosis of the glia around the margin of the cord and in the lateral pyramidal tracts. Secondary degenerations were found in marginal portions of the right column of Goll, Gowers and the direct cerebellar tracts on both sides above the lesion, and the crossed pyramidal tracts, and columns of Türck below the lesion. There was no definite degeneration of Schultze's tract or the other descending tracts of the posterior columns, excepting in the lower lumbar region, where a small area in the triangle of Gombault and Phillippe was apparent.

Dr. Zabriskie said it was interesting, in view of the difference of opinion as to the origin of the fibers in the descending tracts of the posterior columns, to note that in this case, although the right posterior horn was almost completely destroyed, the comma tract and areas of Flechsig and Phillippe-Gombault were not involved; this would seem to point to the exogenous origin of these fibers.

**Report of Two Cases of Tumor of the Ponto-medullo-cerebellar Space (Acoustic Neuroma) with Operation.**—By Drs. J. Fraenkel and J. Ramsay Hunt.

**Case I.**—Reported by Dr. Fraenkel. Operation by Dr. Charles A. Elsberg. The patient was a man, forty-eight years old, a theatrical manager, who entered the Montefiore Home on July 1, 1903. One brother was an imbecile; otherwise his family history was negative. His previous personal history was also without bearing on the present condition. He denied excesses and venereal infection. About five years ago the patient first noticed that his hearing on the right side was impaired, so that he had to use his left ear when at the telephone. A year later his gait became staggering and uncertain, and he could not coordinate his lower extremities at all times. The right lower extremity was the first to be affected. The patient did not notice that he swayed to one side more than to the other. Three years ago his gait frequently was like that of a drunken man, and two years ago a transient diplopia was noticed. About the same time the lower extremities became markedly spastic, his sight became impaired, his speech became stammering, and he noticed that he was tremulous when writing or performing any other intentional function with the upper extremities. During the last year, occasional insufficiency of the sphincters was noticed and he was unable to walk without assistance. At no time was there any pain, paresthesia or girdle sensation. An objective examination showed static and locomotor ataxia. Romberg's symptom was present. The patient falls and inclines to the left side. There is slight mental hebetude and occasional emotional explosiveness. There was motor weakness of all four extremities, particularly on the left side; a tactiform unsteadiness of both upper extremities, particularly of the right; loss of position sense in right-sided upper extremity; exaggeration of reflexes, particularly on the left side; Babinski present on both sides, more marked on the left; marked nystagmus; scanning speech; considerable choked disk, with retinal hemorrhages; deafness of the left ear. Six weeks before operation, a paralysis of all branches of the seventh nerve set in, with marked changes of the electrical reactions. The operation for the removal of the tumor was performed by Dr. Elsberg. The patient unfortunately died from what appeared to be an acute uremia thirty-six hours after the preparatory operation.

Dr. Charles A. Elsberg, who did the operation in this case, said that the opening in the skull was made in a rather unusual situation. In most of the operations for a tumor in the posterior fossa, the cerebellum was ex-



posed by the so-called, occipital craniotomy, in which the opening was made in the occipital bone somewhere between the median line and the posterior margin of the mastoid, and below the level of the lateral sinus. For tumors situated in front of the cerebellum, as was the tumor in this case, and for tumors in the anterior and lateral parts of the cerebellum there were several objections to this method of exposure: (1) It was not the shortest route from the surface of the skull; (2) the manipulations in the removal of the tumor must be done by the sense of touch alone; (3) even with the most gentle manipulations the cerebellum was apt to be contused and its tissues lacerated; (4) in the digital examination of the anterior parts of the cerebellum from the under surface of the organ the finger must come in frequent contact with the medulla and perhaps the pons, and the great danger from even slight injury to these structures was well known. Dr. Elsberg said he investigated this subject for the purpose of finding, if possible, a method by which the disadvantages above mentioned would be avoided. Actual measurements on a number of skulls showed that the shortest distance from the surface of the skull to the anterior edge of the lateral lobe of the cerebellum on the same side was measured on a line which ran along the posterior surface of the petrous portion of the temporal bone, and reached the surface of the mastoid 1 to 2 cm. behind the external auditory meatus. The distance from the outer surface of the occipital bone, below the level of the lateral sinus, to the anterior edge of the cerebellum diminished steadily as the measurements were made more and more distant from the median line. These facts showed that the shortest route to the pontomedullary space on the same side would be through an opening made in the mastoid process. If, in the cadaver, an opening was made in the mastoid region and the dura incised, the lateral edge of the lateral lobe of the cerebellum fell away from the posterior surface of the petrous portion of the temporal bone, so that full one-half of that part of the bone could be seen. With only very slight retraction, the lateral lobe could be drawn sufficiently toward the median line so that the auditory and facial nerves could be plainly seen in their course from the pontomedullary cerebellar space to the internal auditory meatus, and even the 9th, 10th and 11th cranial nerves could be seen in part of their course in the posterior fossa. The auditory nerve could be cut close to its origin with a fine scissors without touching the pons or medulla. Dr. Elsberg said he had performed the operation on the dead body a number of times and was convinced of its feasibility. In the living body, where the cerebellum was filled with blood, the same conditions would be found, although to a somewhat lesser degree. This had been demonstrated by Krause, of Berlin, in a somewhat similar operation devised by him in a case in which he cut the auditory nerve in the posterior fossa for the relief of a persistent tinnitus aurium. As was well known, considerable of the lateral parts of the cerebellum could be cut away without causing a permanent disturbance in the functions of this part of the brain. Therefore, this was the part of the cerebellum that could be handled with the greatest safety, and at the same time, could be most easily retracted. From these facts it followed that the approach to the anterior edge of the cerebellum along its outer edge was not only the easiest, but also the route by which the organ was least apt to be injured during manipulations. An examination into the anatomical relations of the parts in the posterior fossa would soon make it clear that when the pontomedullary cerebellar space was approached from the mastoid region along the outer edge of the lateral lobe of the cerebellum, neither finger nor instru-

ment need come in intimate contact with the pons or medulla until the space itself had been reached. It was probable that the correct way to remove tumors from this region was to expose the structures on the central side of the tumor, if possible, and first divide these, and then to work outwards all of the time, away from the pons and medulla. Hence, with this lateral method, the danger of wounding these important structures was reduced to a minimum.

Dr. Elsberg thought it was advisable, in almost all of these cases, to operate in two stages. On Jan. 21, 1904, under chloroform anesthesia, the bone was exposed by a flap of the soft parts, including the periosteum over the mastoid and outer parts of the occipital regions. An opening was then made with the cranial drill, chisel and rongeur, measuring 5 by 8 cm., and extending from above the superior curved line of the occipital bone to within  $1\frac{1}{2}$  cm. of the margin of the foramen magnum, and from within 1 cm. of the external auditory meatus to 3 cm. from the median line. In the upper part of the wound the occipital lobe, covered by its dura, was visible, and in the lower part, the right lobe of the cerebellum, covered by its dura. The greater part of the lateral sinus of the right side was thus exposed. The wound was then closed, the flap being sutured back into place, and a voluminous dry dressing was applied. The patient was considerably shocked at the end of the operation, but he reacted well to stimulation. His condition remained fairly good until the second day, when his kidneys ceased to act and he passed into a uremic condition and died in forty-eight hours. The skin-flap was turned back about two hours after death and the dura incised. With the head turned to the side, the tumor could be plainly seen at a depth of from 3 to 4 cm., and when the finger was introduced it was found that the tumor could be peeled out with the greatest ease. It seemed probable that had the patient survived the first operation, the removal of the tumor could have been accomplished at the second operation in a short time and with very little difficulty. After the patient's death it was learned that he had had an attack of acute nephritis, with general edema, some years before, and although the urine had been carefully examined prior to the operation and had showed no evidence of renal disease, it was just to suppose that long-standing kidney trouble was the probable cause of the acute suppression of urine after the operation.

*Case II.*—Reported by Dr. Hunt. Operation by Dr. George Woolsey. This patient was a pedler, forty-two years old. Six years ago he began to suffer from an annoying tinnitus in the left ear, followed by some impairment of hearing. During the past four years he has had occasional occipital headaches, with vertigo. These symptoms gradually increased in severity and were accompanied by cloudiness of vision. For the past six months there has been unsteadiness of gait. When he first came under Dr. Hunt's observation, the watch tick was not perceptible with the left ear, and the tuning-fork was very faint to aerial and bone conduction on that side. There was paresis of the left seventh nerve, more apparent in its upper branch, with slight quantitative electrical changes. There was paresthesia in the sensory distribution of the left fifth nerve, with objective sensory disturbances. The pupils were unequal, the left being wider than the right. Reactions were present. There were amblyopia and choked disks, and a slow nystagmus in extreme positions. There were hemiasynergia and hemiataxia of the left side. In falling, the patient favored the left, and progression was decidedly to that side. The nuclear reflexes were active; the knee-jerks exaggerated, the left more so than the

right. There was no ankle-clonus. The skin reflexes were present; no Babinski. The diagnosis of a neurofibroma of the left acoustic nerve was made, and operation was advised. From the known pathological character and relation of the surrounding structures of this variety of tumor in general, it was possible not only to localize the growth, but to state in general terms its situation in the pontocerebellar space outside of the brain substance, its possible size and consistence, and its enucleability. Its attachments to the surrounding structures consist only of the leptomeninges, blood vessels and adhesions, and when these are divided it would be possible to lift the growth out of its socket in the brain with ease. With these data at his disposal, Dr. Woolsey decided on entering the occipital bone on its posteroinferior surface, to the left of the median line and below the lateral sinus. The index-finger was inserted through the trephine opening and beneath the left cerebellar hemisphere, coming in contact immediately with the nodular surface of the growth, which was broken up by gentle manipulation and removed in fragments. There was a tendency for the cerebellar hemisphere to rise into the trephine opening, and this, with the digital manipulation caused some laceration of its substance, with oozing. Following the removal of the growth, the respirations of the patient became irregular and shallow, with occasional alarmingly long intervals. The pulse was rapid. The operation, which was done under ether, had required nearly two hours. At 5 P.M., three hours after the completion of the operation, the patient's temperature was 102° F.; pulse, 112; respirations, 26. The breathing had improved in character, and the patient seemed to be reacting. Slight clonic twitchings of the left side of the face were noticeable. Death occurred at 1 A.M., apparently of respiratory and cardiac failure, just twelve hours after the operation. Permission was obtained to remove the brain only. The outer surface of the dura was dotted here and there with little tufts and excrescences, which proved to be attached to the brain cortex and when torn away, they left minute depressions, with a punched-out border. Examination of the base showed that the tumor had been almost completely removed, only two small fragments remaining, together with a small blood-clot, scarcely larger than the little finger-nail. The inferior surface of the cerebellum was lacerated, but there was no external evidence of injury to the pons and medulla. The general ventricular cavity of the brain was dilated, showing that there had been a not inconsiderable internal hydrocephalus. Upon splitting the *worm* of the cerebellum, Dr. Hunt said he was surprised to find a firm, rounded projection from the left side of the floor of the fourth ventricle, corresponding to the site of the tumor. Microscopic sections through the brain proved this to be an extensive edema and hemorrhagic infiltration of the left peduncle of the pons, evidently arising from the region of the lacerated cerebellum and gradually encroaching on the vital centers of the medulla. This internal pons hemorrhage was probably the immediate cause of death.

Dr. George Woolsey said he was much interested in the class of tumors described in the cases reported by Drs. Fraenkel and Hunt, for they were so definitely localizable and could be so readily enucleated that they were very suitable for surgical treatment if they could be successfully exposed. He believed that this could be done. In the case he had operated on several months ago, which was referred to him at Bellevue Hospital by Dr. Hunt, he knew of no previous experience to serve as a guide in the operation. The tumor was approached from behind and the side by removing a large area of bone, comprising all that part of the occipital bone below the superior curved line and to the left of the me-

dian line. The opening left only a narrow bridge of bone between it and the foramen magnum, and extended forward into the mastoid until the bone became very thick. Passing the finger beneath the cerebellum, the tumor was felt and removed piecemeal. This necessitated introducing the finger a number of times, and there was some laceration of the lateral lobe of the cerebellum which did not seem of any moment. The tumor was larger than he had expected to find it. In another case he would try to pass a forceps along the finger, seize the tumor, enucleate it with the finger and remove it entire. The plan of operating in two stages, recommended by Horsley and employed by Dr. Elsberg he thought was most excellent where the exposure was prolonged and much blood was lost. He thought Dr. Elsberg's method of approach had much to commend it, although it was not so much nearer the site of the tumor than the opening he had made as might be inferred. It had the objection that the bone was very thick, so that too much time, and perhaps blood was lost in getting through it. In operations on brain tumors it was important not to take too much time in the exposure alone. This objection was obviated by operating in two stages. Dr. Woolsey said the entire operation in his case took no longer, if as long, as the exposure in Dr. Elsberg's case. After the operation, his patient seemed in good condition and appeared to suffer but little from shock, but symptoms of the latter appeared several hours later, and he failed to rally. On the whole, in another similar case, he would be inclined to operate in two stages and by the lateral approach suggested by Dr. Elsberg.

Dr. George E. Brewer said he had been interested in the subject of cerebral tumors for many years. He had twice explored the posterior fossa, in the first instance finding a sub-cortical cerebellar growth of tuberculous origin, which was successfully removed, the patient making an excellent operative recovery. He died some months later, however, from general tuberculosis. In the second case the patient succumbed after an extensive bone removal, undertaken simply to relieve pressure. A number of anatomical investigations carried on in the dissecting room of the College of Physicians and Surgeons led the speaker to advocate the plan of opening the skull by removing, practically, all of the bone below the superior curved line to within half an inch of the foramen magnum below, and from the median line to a point half-an-inch behind the mastoid. By opening the dura, the finger could be easily passed behind the lateral lobe and reach the situation of these tumors at a depth of less than an inch and one-half from the surface of the wound. Of course, adequate exposure to remove such a growth would necessitate the destruction of a portion of the lateral lobe: this, however, could be done without serious trouble to the patient, as had been demonstrated in his first case. It was Dr. Brewer's opinion that speed of operation was perhaps the most important factor necessary to success, as these patients almost invariably died if the operation was at all protracted. He was in favor of doing the operation, when practicable, in two stages. The first operation should consist of the removal of the bone only, which to a certain extent relieved the pressure, and at a subsequent period the dura should be incised and the tumor removed. He thought the primary operation should be done in from twenty to thirty minutes.

Dr. Hunt, in closing, referred to a previous communication, published in conjunction with Dr. Fraenkel, in which five cases of tumor of the pontocerebellar space were recorded. In that paper, especial stress was laid on the certainty of localization and the enucleability of this group of tumors, and their surgical importance.



In both of the cases under discussion, in which operation was attempted, the diagnosis of an acoustic neuroma was made, and the operative procedure was modified to meet the known anatomical peculiarities of this type of tumor. In Case I the patient succumbed thirty-six hours after the performance of the first stage of the operation, apparently from shock, although a renal complication could not be excluded. In Case II death was due to laceration of the cerebellum, with resulting effusion of blood into the tissues of the medulla and pons. Both of the operations were prolonged and tedious, and considerable trauma was inflicted in removing the thick occipital bone, and enlarging the trephine openings. It seemed of paramount importance, in exposing tumors in this locality, that the operation be done expeditiously and with great gentleness, as any concussion must be especially effective in this region. The division of the operative procedure into two stages was also to be recommended.

#### JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

*Stated Meeting, held March 21, 1904.*

**Two Cases of Gout in Negroes.**—Dr. Fitcher reported these cases. The first was a man of thirty-one years, who was admitted to the hospital complaining of dyspnea and rheumatism. He had had no infectious diseases except measles. There was a marked alcoholic history extending over many years. About six months previously he had had an attack of "rheumatism" in the left big toe joint from which he recovered. On admission the same joint was swollen, red and sensitive. The heart was enlarged and there were physical signs of mitral stenosis and insufficiency and of aortic insufficiency. The acute gout subsided; but the patient was again admitted some weeks later with signs of broken compensation (cyanosis and edema). The symptoms cleared up but about two months subsequently the patient was admitted for the third time, complaining of dyspnea and edema. He died, in a semicomatose condition, within twenty-four hours. Autopsy showed a mitral insufficiency and stenosis, aortic insufficiency and a sodium-biurate deposit in the synovial membrane of the big toe-joint. Dr. Fitcher thought that there was probably no relation between the gout and the heart condition. The second patient, a man of twenty-four years, was admitted with anemia, puffiness of the eyelids, and marked headaches. The urine contained albumin and casts. There was swelling of the left big toe-joint with pain and tenderness, but this disappeared in two weeks. Headaches became worse, coma appeared and death followed. Autopsy showed a chronic interstitial nephritis of the "small white" variety. The interest of these cases lay in the rarity of the disease in negroes, no other case having occurred at the Johns Hopkins Hospital.

**Relation of Uric Acid to Gout.**—Dr. Schmolli spoke on this subject. Two theories have been advanced: one based on retention due to the failure of the kidneys to excrete (Garrod) and the other on an actual increase in formation of uric acid. Neither theory, however, is tenable. Gout may be due to precipitation of uric acid from the blood (for it exists there though not detectable on account of its combination with thymic acid), or to an actual synthesis.

**Piezometer.**—Dr. Kelly showed a new instrument recently devised for him for accurately recording the findings of palpation, substituting an objective method for the subjective touch sense. It is called a Piezometer and registers differences of hardness and softness, of rigidity and of pressure needed to cause pain.

**Myomectomy in its Relation to Pregnancy.**—Dr. Kelly also read this paper. Formerly in all cases of myoma panhysterectomy or supravaginal hysteromyomectomy was done; but with improvement in technic myomectomy has been more commonly practised. Two hundred and thirty-one such operations have been done at the Johns Hopkins with six deaths. The following are the reasons for the procedure: (1) It removes the disease without the uterus. (2) It avoids menstrual disturbance and an artificial menopause. (3) It allows conception. (4) It does not cause the mental distress which accompanies removal of the uterus. Of 140 subjects reviewed by Dr. Kelly from his own work four have conceived. The patients presented various types and sizes of myoma; two of them have borne full-term children, one miscarried and one is now pregnant. Schauta, Wurder and Olshausen have reported cases of conception following myomectomy, but there is no series which shows quite this proportion of successes.

Dr. Noble said that he was a myomectomist but not an extreme one, believing in the operation under a number of limitations. The woman should be under thirty-five years, the tumors small in size and number, the patient's full consent gained for the more dangerous procedure, and a strong desire for children present. He knew of at least two children born of women on whom he had performed myomectomy.

#### Observations on the Subclavian Artery in Man.

Dr. Bean reported these, which were made in the dissecting rooms of the Johns Hopkins Anatomical Laboratory. Two hundred and nineteen subjects were studied and five general types of the artery observed. Four anomalies were found: (1) A lateral thoracic artery in 5 of 28 cases. This may have clinical importance in broken rib, tapping of the pleura or resection of a rib. (2) Thyroida in an artery supplying the lower half of the thyroid gland, of clinical importance in tracheotomy and surgery of the thyroid. (3) An anomalous right subclavian artery. (4) An anomalous origin for the arteries from the first and second parts of the subclavian.

#### MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND.

SECTION ON CLINICAL MEDICINE AND SURGERY.

*Stated Meeting, held March 18, 1904.*

**Pneumonia.**—Dr. Pleasants read a paper on the statistics of this disease and exhibited a chart showing the mortality curve for tuberculosis and pneumonia during the past fifty years. The former has steadily fallen and the latter steadily risen. The banner years for pneumonia deaths in Baltimore being 1900 and 1903-'04. The mortality from pneumonia this year though large has been exaggerated by the newspapers. Exposure at the time of the fire, and unusual climatic conditions have been suggested as the causes, but there is little proof for either. The large negro population of Baltimore of course accounts for a great number of the cases here. The total death rate in that race being twice that of the white. The morbidity of the disease is hard to estimate, and whether the mortality increase of the last fifty years is really due to an increased number of cases or an increase in the fatality it is impossible to say. The following factors must be considered in explaining the increased mortality of the disease: (1) Increase in the density of the population; (2) general prolongation of life, and reduction of intestinal diseases among children; (3) climatic fluctuation; (4) increase of immigration; (5) the negro element; (6) more accurate diagnosis, with better autopsies and death reports; (7) decrease

of death rate from tuberculosis; (8) the presence of influenza, with which pneumonia is evidently closely connected; (9) a theoretical increase in the virulence of the pneumococcus.

**Bacteriological Knowledge Concerning Pneumonia.**—Dr. Welch dilated on this subject. In spite of the complete studies of the disease, this knowledge has had practically no influence on the clinical attitude. The organism first discovered by Sternberg in 1880, confused with bacillus by Friedländer in 1883, and clearly described in 1886 by Fränkel and Weichselbaum, is found in all cases of true lobar pneumonia. It is a delicate organism, but by proper methods can always be demonstrated. It is characterized by short viability in cultures and in the body, and by its causing a local inflammation, but it also sets free a toxin (causing the pneumonic fever of Flint). Following the discovery of the toxin of diphtheria and tetanus attempts were made to produce a similar substance for pneumonia. This, however, is bacteriologically an impossibility, and the evidence that the pneumococcus produces a toxin is entirely clinical. The organism is thought by some to be only a variety of the streptococcus. It is harbored normally by 20 per cent. of all people, and the accessory causes of pneumonia are therefore almost the efficient causes. In fact, there is no disease in which such emphasis must be laid on the so-called accessory causes. It is hard to decide to just what extent the disease is contagious, but there is no bacteriological basis for making it a reportable disease. It is unknown in Arctic expeditions which would seem to point against exposure as one of its causes. It may cause septicemia. The immunity which it produces is in human beings only transitory. A definite artificial immunity, though of not a high degree, is easily produced, and the serum from animals so immunized undoubtedly protects against the disease. But all antibacterial (as distinguished from antitoxic) sera are uncertain, and this is exceedingly true of the pneumonia serum, the clinical value of which is of very great doubt.

**Hospital Experience.**—Dr. Osler discussed pneumonia as he has seen it in his hospital experience. One of the striking features of the disease is its sameness. In the past twenty-six years he had studied the disease in three large hospitals in various parts of North America, but its clinical features were always uniform. This is particularly true of the mortality, which Dickerson showed several years ago to remain (when large numbers of cases are considered) absolutely uniform. In the Johns Hopkins Hospital the average mortality has been 26 per cent., and the same figures hold for the Massachusetts General Hospital, for the Montreal General, and for Blockley. In private practice of course a smaller proportion of deaths is seen, but terminal pneumonias are often overlooked here, ether pneumonias are very rarely seen, and other causes operate to reduce the mortality. There is no disease the familiarity with which can be more valuable to the student than pneumonia, and at the Johns Hopkins the students are thoroughly drilled by constant clinical contact with this disease and with typhoid.

**Therapeutic Side of Pneumonia.**—Dr. Atkinson discussed this side of the question. Pneumonia is largely a local inflammation and it ends by crisis. The body is therefore limiting the disease anatomically and preparing in the end to overcome it which, if undisturbed, it can do. The indications then are plainly (1) to aid the natural tendency to recovery, (2) not to interfere with it (as for instance by the administration of nauseating expectorants). Some of the cases will die and others will get well, no matter what we do, but between these two classes lies the field for therapeutic interference. There

is of course no specific for this disease. Bloodletting, veratrum viride and sera, whatever their value, are not specific. Bloodletting is too much neglected, and is particularly of value when the right heart is overdistended. The therapeutic rule should be to go slow with treatment, to watch the case carefully and to try to help nature rather than to make any definite attack on the disease itself. Rest, relief of pain and sleep should be obtained by morphine. Small doses of strychnine and alcohol provide the necessary stimulants when the heart lags. The ice-bag and cold sponges should of course be used. Oxygen is of value, if administered in time. Digitalin and nitroglycerin should be avoided, but saline infusions are of value in increasing diuresis.

## BOOK REVIEWS.

**MODERN MICROSCOPY.** By M. I. CROSS and MARTIN J. COLE. Third edition. W. T. Keener & Co., Chicago.

THERE is always an eager band of students to whom the mysteries of the microscope offer a most enticing field. Guides to the proper use of this book of nature are not many and we welcome all that promise to be of use to the searchers after the hidden secrets of organic life.

This is a handy and useful volume and can be thoroughly recommended to the student. How to use the microscope, how to mount, stain and present specimens, are all well told. We cordially grant it a place of honor on our laboratory table.

**A TEXT-BOOK OF LEGAL MEDICINE AND TOXICOLOGY.** Edited by FREDERICK PETERSON, M.D., Clinical Professor of Psychiatry, Columbia University, and WALTER S. HAINES, M.D., Professor of Chemistry, Pharmacy, and Toxicology in Rush Medical College. Vol. 2. W. B. Saunders & Company, Philadelphia, New York and London.

FOR a number of years this work has been anxiously awaited, as there has been a distinct need for a more authoritative and modern work on the subject than is possessed for the English reading public.

The time spent has not been wasted, for in these two volumes, taken in their entirety, we possess a thorough and modern encyclopedic handling of the subject-matters of legal medicine and toxicology.

We would like to have space to comment on some of the excellent features of this second volume, but beyond the expression of commendation for the entire volume we cannot stop to particularize.

**MEDICAL JURISPRUDENCE.** By EDWIN WELLES DWIGHT, M.D., Instructor in Legal Medicine, Harvard University. Lea Brothers & Co., New York and Philadelphia.

WE do not know of a similar quiz compend on this subject that adapts itself so thoroughly to the needs of the average student as this.

As a rule it takes many years in practice before one exhausts, as it were, the simple questions that are here treated, and each one in its turn comes up in an unexpected manner and oftentimes the ingenuity of the physician is severely taxed in adapting himself to the unfamiliar medicolegal relationships.

Death, presumption of, survivorship, identification of the dead, causes of sudden death, medicolegal aspects of pregnancy, abortion and divorce, medicolegal aspects of insanity, life insurance, etc., are among the topics discussed. For a handy and ready work of reference this small epitome is a much appreciated help. We commend it cordially to beginners.